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FOREIGN MINE WARFARE EQUIPMENT

DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

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FOREIGN MINE WARFARE EQUIPMENT

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CHAPTER 1

PURPOSE AND SCOPE

1-1. Purpose

This manual is issued for use in training and in the field as a guide in the identification, use, functioning, installing and arming, and disarming of foreign mines and fuzes. It also provides information necessary for training in the identification, functioning, and operation of related equipment.

1-2. Scope

a. *Content.* This manual contains technical information on mine warfare equipment in use by the Eurasian communist and free world countries.

b. *Application.* The information in this manual is applicable to both nuclear and nonnuclear warfare.

c. *Use of Manual.* This manual contains information

necessary for the instruction of soldiers in the functions and in identification of foreign mines and fuzes. The manual is issued in looseleaf form to facilitate revision or additions and permit ready disassembly for the organization of instructional material and distribution as handouts. The format and illustrations permit use in projectors.

1-3. Reporting of Equipment Manual Improvements

Reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to the Commandant, US Army Engineer School, Fort Belvoir, Va., 22060. Air Force should submit reports in accordance with technical order 00-5-1.

CHAPTER 2

HISTORY, TERMINOLOGY AND GENERAL SAFETY REGULATIONS

Section I. HISTORY AND TERMINOLOGY

2-1. Development of Mine Warfare

a. Originally mine warfare was tunneling beneath unpenetrable enemy positions and placing explosives there to destroy them. This was known as sapping and dates far back in military history. Mine warfare did not become prominent, however, until World War I, when late in 1914 on the Ypres front, the Germans placed charges in tunnels dug under the British lines, which they fired at the opening of their attack. This had the effect the Germans expected. When their first assault wave reached the British position, the Germans found the British defenses so badly shocked by the explosions that they were able to pass through without difficulty.

b. Mine warfare as we know it today, however, began when the Germans produced or improvised land mines from artillery shells as a countermeasure against the newly introduced British armored tanks. These were detonated electrically when the tanks reached the mined area. At the same time the Allies also developed an antitank mine of artillery shells that detonated under the weight of a tank. These German and Allied improvisations, though crude, were very effective. This type of improvisation has also been used by North Vietnam.

c. During World War II, as mine warfare was carried on widely on both sides, land mines were developed to a very high degree. They came to include a variety of antitank, antivehicle, dual-purpose, and antipersonnel mines with a variety of fuzes. Mine cases, at first made largely of steel, were later made from all sorts of nonmetallic materials.

2-2. Definitions

a. *Firing Device.* A metal case containing an initiator and spring propelled metal pin, designed to set off the main charge of explosives contained in boobytraps, antipersonnel mines, antitank mines, and demolition charges. There are four types: pressure, pull, release, and combinations thereof.

b. *Arming.* Arming is the removal of all safety devices so that the mine is ready to function.

c. *Disarming.* Disarming is the replacing of safety devices on fuzes or the removal of fuzes so that a mine will not function. Some fuzes, however, cannot be disarmed.

d. *Trip Flare.* This is an illuminating device used as a warning against intrusion into an area.

e. *Fougasse.* This is an improvised mine that consists of an explosive charge laid in the bottom of a shallow hole with the opening toward the enemy sloped at 45°. A board is placed on top of the explosive and scrap metal, rocks, or fragments are placed on top of the board. Containers filled with gasoline may also be placed on top of the board to create a flame fougasse.

f. *Daisy Chain.* A device consisting of one or more antitank mines, usually wooden, attached to a board that slides or rotates on a pivot. It is pulled in the pathway of a tank by means of a long wire or rope by an operator from a defilade position.

Section II. GENERAL SAFETY REGULATIONS

2-3. Precautions

- a. Handle all mines and fuzes with care at all times.
- b. Permit only one man at a time to work on one mine.
- c. Examine carefully the ground around a mine before starting to work on it.
- d. Be constantly on the lookout for boobytraps.
- e. Before lifting a mine, neutralize all fuzes.
- f. Never cut or pull a taut wire, never pull a slack one. Look at both ends of a wire before you touch it.
- g. For greatest safety, destroy the mine in place with explosives. Charges are placed on or near the mine and exploded from a safe distance.
- h. Take cover before pulling a mine, and do not come out for at least 30 seconds after you have pulled it. There may be a delay fuze. Examine the covered position for boobytraps before occupying it.
- i. Never use force on a mine or boobytrap. If a part cannot be removed without applying an undue amount of force, stop removal and destroy in place.
- j. If a mine or boobytrap must be left unlifted, mark the location prominently and notify nearby unit headquarters.
- k. Neutralize all antipersonnel mines by replacing all safety pins before you lift them.
- l. If it is absolutely necessary to walk into a mined area, move slowly looking at the ground carefully to note disturbances in the soil and the presence of any tripwires.
- m. Use improvised grapnels to detonate tripwire actuated mines. The grapnels are thrown out over the field and then pulled back, setting off the mines.
- n. When cutting the wires of an electrical detonator, cut and tape them one at a time to avoid closing the circuit with the wire cutters. A mine is harmless if the firing chain is broken, *but there may be more than one firing chain.*

2-4. Antitank Mines

- a. Never uncover an antitank mine until the ground has been thoroughly checked for antilift devices. Probe every square inch cautiously, for even the disturbance of the earth by the probe

may release the fuze striker. A nonmagnetic probe is the safer to use, as the mine may have a magnetic fuze.

- b. Never remove the pressure plate from a metallic antitank mine, unless the mine can be positively identified as one that is not fitted with an antidisturbance fuze. This involves great risk, even in identifiable mines, as combination pressure and pressure-release (antidisturbance) fuzes are available in almost all armies.

- c. Be extremely careful in disarming wooden antitank mines by hand. Frequently, holes are drilled through the bottom of the case through which pull wires connected to auxiliary fuzes are threaded and anchored to a stake underneath. If the stake is driven down deeply enough, it is not easy to locate the wire by probing. A pressure-release fuze or a pull fuze with pull wire may be actuated by raising or removing the pressure plate or lid. Some wooden mines have a special mousetrap type of device that is actuated in this way.

- d. Remember that wooden antitank mines with pull fuzes inside the case are frequently fitted with a pull wire anchored to a stake underneath the mine or to a rigging inside that detonates the mine at the disturbance of the lid or pressure plate.

- e. Be extremely careful with wooden antitank mines that have remained buried for a comparatively long period. Because of soil conditions, the wood deteriorates so that the slightest inadvertent pressure on the top may initiate the fuze. Wooden box mines with the pressure plate or lid supported on wooden dowels are particularly dangerous in this respect. DESTROY THESE IN PLACE.

- f. Never raise antitank mines from their emplacement by hand unless they can be positively identified, even though the entire outer surface has been carefully explored and all antilift devices have been disarmed. There may be an antilift fuze inside that may be initiated by a very slight jar; also a vibration fuze, whereby a slight tilt of the mine may close a circuit. The safest procedure is to pull the mine out by means of a rope and some sort of grapnel from a defilade position.

2-5. Antipersonnel Mines

- a. Neutralize all antipersonnel mines by replacing all safety pins before you lift them.

b. Be extremely careful in hand-disarming anti-personnel mines with tripwire actuation. Before cutting tripwires, trace them from mine to anchor (often the anchor may be another mine). Be on the alert for small antipersonnel mines laid along the side or underneath the tripwire to hinder disarming. Always trace the tripwire from the friendly side—DO NOT STRADDLE IT—as a safeguard against accidental tripping or stepping on a small antipersonnel mine laid underneath the tripwire. If possible, INSERT A SAFETY PIN IN THE FUZE BEFORE CUTTING THE TRIPWIRE.

2-6. Fuzes

a. Be extremely cautious in disarming tilt fuzes by hand, especially if they have been partially initiated. THERE MUST BE NO MOVEMENT OF THE TILT ROD when the fuze is removed from the mine. Some may not have a safety, a safety may not be available, or a safety pin cannot be inserted.

b. Use extreme caution in disarming snap fuzes by hand, as they may be partially initiated by contact or blast and a slight jar or movement will

set off the mine. Some may not have a safety, a safety may not be available, or a safety pin cannot be inserted.

2-7. Picric Acid Explosive

DESTROY IN PLACE ALL MINES CHARGED WITH PICRIC ACID EXPLOSIVE. Extremely sensitive explosive salts may have formed whenever the explosive contacts the metal, particularly in the threaded areas of the fuze and fuze well.

2-8. Fuzing and Rendering Safe

a. *Arming.* Most mines used by the Eurasian Communist countries are of the simple pressure, pull, or pressure-release type, or are command controlled by the use of an electric blasting cap connected to a source of power. The only known exceptions to these are the pressurized chemical fuzes in difficult-to-detect mines.

b. *Disarming.* In disarming any mine, the first consideration is to determine the number and type of fuzes incorporated within the mine. Once a determination has been made, the safety procedures outlined in paragraphs 2-3 through 2-7 must be adhered to.

CHAPTER 3

LAND MINE AND BOOBYTRAP LOCATIONS, USES, AND EFFECTS

Section I. LOCATIONS

3-1. Land Mine Locations

Land mines may have fixed or movable locations, depending on the tactical situation and the nature and position of the target.

a. Fixed Location. Mines may be placed as high as 6 feet above the ground. The Italian B-4 fragmentation antipersonnel mine is a good example, having six spikes in a flattened portion of the outer cylinder for fixing it against a tree or post. Mines may also be laid on the surface of the ground, such as the British ointment-box antipersonnel mine. Antitank mines are usually buried 5½ to 8 inches below the ground surface, but have been found buried as deep as 4 feet.

b. Movable Location. Mines that move include:

(1) Rocket-propelled mines, such as the Soviet LMG antitank mine.

(2) Bounding or mortar mines, such as the British Mark 2, that bound into the air and explode scattering fragments or shrapnel over a wide area.

(3) Floating or drifting mines.

3-2. Boobytrap Locations

Boobytraps (fig. 3-1) may be found in abandoned areas, abandoned buildings, and all other places occupied by an enemy force. Boobytraps or dirty trick devices are usually installed as the occupying force vacates an area.

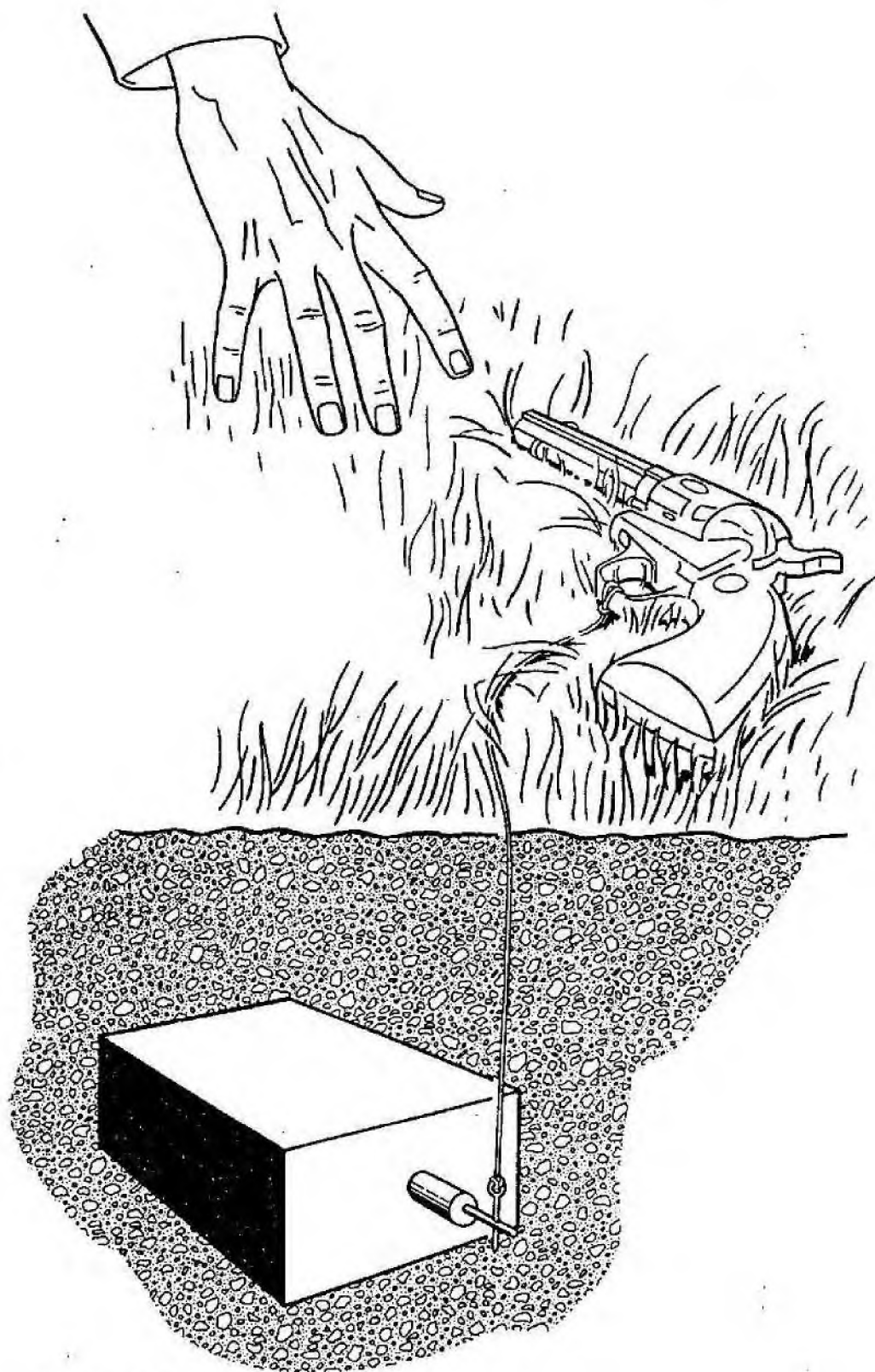


Figure 3-1. Pistol boobytrap.

Section II. USES AND EFFECTS

3-3. Antitank Mines

Antitank mines are used to immobilize or destroy tanks or other vehicles. They are usually emplaced on or slightly below the ground surface. Ordinarily they detonate by the application of 300 to 400 pounds pressure on the pressure fuze; however, the actuation pressure may be modified to produce detonation from lighter pressure, such as running soldiers. Present antitank mines contain 12 to 80 pounds of high explosive. Antitank mines have the following effects when detonated:

a. Blast. Pressure waves from the detonation of the mine explosive immobilize tanks by damaging their tracks. These mines usually contain the maximum explosive charge. Smaller charged mines may be placed double or triple to achieve a stronger blast. Blast type antitank mines may have a fixed location on the surface of the ground or they may be buried, ordinarily no deeper than 15 centimeters, below ground surface.

b. Cavity or Shaped Charge. These mines are the tank destroyers. Gases formed during the detonation of the cavity form a high velocity jet capable of penetrating armor. Cavity or shaped charge mines are fused so that the jet strikes the belly of the tank in the vicinity of the fuel compartment or magazine. A good example of such mines is the French offset mine.

c. Misznay-Chardin or Plate Charge. These mines are also tank destroyers. They function by propelling a plate at high velocity in the forward direction of the detonating wave. They require sufficient standoff space for the flat plate to change into a mushroom-shaped slug. If the mines explode underneath the tank tracks and there is no standoff space, they produce no more than a blast effect.

d. Chemical.

(1) *Gas.* Gases having a high persistency are an effective means of stopping tanks through contamination, by which personnel inside and supporting infantry are both affected.

(2) *Incendiary.* Incendiary mines are mostly field improvisations, consisting of some sort of container with a well for an electric or nonelectric blasting cap and filled with thickened fuel. These are usually initiated, however, by controlled methods.

3-4. Antipersonnel Mines

Antipersonnel mines are used to disable or kill personnel. They may be laid in antitank minefields, in obstacles to delay breaching, in antipersonnel minefields, or isolated locations for nuisance purposes. Antipersonnel mines produce four kinds of effects as follows:

a. Blast. This effect produces casualty by concussion. Blast type antipersonnel mines are generally intended to kill or injure only the persons that actuate them. They may be laid on the ground surface or slightly below. They may be small plastic-cased mines such as the British ointment-box. They contain a fraction of an ounce to 4 ounces of explosive and a fuze that functions under as little as 5 pounds pressure.

b. Fragmentation. Fragmentation effects are obtained from mines made of solid metal—cast iron or steel—with a bursting charge that projects fragments in all directions (Soviet POMZ-2). Static fragmentation mines may be placed above the ground or on the surface. Bounding fragmentation mines are placed below the surface.

c. Shrapnel. Shrapnel mines consist of a bursting charge surrounded by preformed missiles, such as ball bearings or small pieces of scrap metal. The detonation of the bursting charge projects the shrapnel at high velocity. The static type may be placed above the ground or on the surface and the bounding type, below the surface.

d. Cavity Charge. A cavity charge is a shaped charge which employs the hollow charge principle. The force of the explosive is concentrated along the axis of the hollow cavity, e.g., a cone or wedge. The cavity may be lined with metal, glass, or similar material and filled with metal fragments to produce shrapnel effect.

3-5. River Mines

These are floating or drifting blast effect mines used to destroy floating bridges, piers or fixed bridges, and ferry equipment (Russian river mines).

3-6. Dummy Mines

Such mines may be made of readily available materials and emplaced in dummy minefields. They may also be used to supplement real mines in a live minefield to delay and confuse the enemy.

3-7. Inert Mines

These are similar in construction to standard mines but contain no explosive charge. They are used for training purposes.

3-8. Practice (Training) Mines

A practice mine is a replica of a standard mine, with vent holes, that emits a puff of smoke or makes a noise to simulate detonation.

Section III. DETECTION AND REMOVAL METHODS

3-9. Detection Methods

There are three common methods for the location of land mines—visual inspection, probing, and electronic detection. Visual detection is one of the best and most effective methods of locating mines embedded in most types of soils. Indications of buried mines are disturbed soil, piles of stones, debris from mine packaging, and often enemy minefield markers. Probing is the detecting of buried mines by penetrating the earth with a sharp instrument—a probe, bayonet, or stiff wire. The probe should be pushed into the ground carefully from about a 40-degree angle to avoid putting pressure directly on top of the mine. Although it is slow and monotonous, probing is the surest, and most effective method of locating mines. On the other hand, electronic detectors though useful in many cases, are not always dependable. They all emit false signals. Metal detectors react to nails and other pieces of metal as well as to mines, while nonmetallic detectors react to a tree root or an air pocket.

3-10. Removal Methods

a. Mines are removed by manual, mechanical, and explosive methods. Mine removal, always risky and difficult, may be accomplished relatively safely by the combination of approved techniques. The instrument or method selected depends on the location of the mines and the orders received. The safest removal is detonation in place, the next safest is remote removal. The least desirable is hand removal. Heavy equipment, such as the tank-mounted roller, plow, and flail, have been used but their effectiveness is limited.

b. Flexible explosives cables, bangalore torpedoes, and heavy-cased linear charges are adaptable to the removal of mines. Another method is artillery fire, but this is costly and time consuming, and has a low probability of effectiveness. Artillery fire also puts a lot of added metal into the ground, thus adding to the problem of detection in the area.

CHAPTER 4

EURASIAN COMMUNIST COUNTRIES LISTED

4-1. Text Coverage

As the following Eurasian Communist countries are considered to have a significant mine warfare capability, their mine warfare methods and equipment have been included in this text:

Communist China	North Korea
Czechoslovakia	North Vietnam
East Germany	Poland
Egypt	Soviet Union
	Yugoslavia

4-2. Soviet Influence

Soviet influence on mine warfare methods and equipment will be found in all Eurasian Communist countries. These countries have adopted certain Soviet materiel to their own manufacture, and Soviet materiel can be expected to be used by these countries.

zones, and to inflict losses to equipment and personnel.

5-4. Minelaying

a. Basic Considerations.

(1) The method and actual installation of mines depend on such considerations as the type required, the time of year and condition of the ground, enemy fire and its effectiveness, the time allotted for laying, and the time of laying—at night or in the daytime. In the autumn, mines are laid if possible in dry elevated ground and buried shallowly under a thin layer of camouflage to assure unaffected functioning when the ground freezes. In winter, they are usually laid both in areas of snowdrifts or where drifting is unlikely. The snow is compacted to provide a base; in deep snow, however, boards, planks, or other firm supports are put underneath. On roads where the snow is compacted, the top of the mine is often set to protrude from 1.5 to 2.5 centimeters above the surface, and then camouflaged with a layer of snow.

(2) In high grass and other forms of natural concealment and at times when enemy action compels it, antitank mines are planted without special camouflage. In hard ground they are projected about one inch above the surface; in soft

ground, they are buried flush. In swampy or very loose soil, boards or other supports are put underneath. The Soviets avoid placing pressure type antitank mines in small depressions or other ground hollows because passing tanks may not be able to transmit sufficient detonating pressure upon them.

(3) Dummy mines and deceptive indications of minelaying are combined with live mines. All signs of buried mines, such as fuze boxes, paper wrappings, packing crates, and spoil are removed. Particular attention is given to the camouflage of minefield travel lanes.

b. Minelaying Methods.

(1) *Spacing cord.* Mine laying engineers make wide use of the spacing cord method, which makes possible the accurate setting of each mine and its relocation in breaching or clearing the field. The spacing cord is a piece of tracing tape, wire, or cord 30 to 50 meters long, with one metal ring at one end and two at the other. Rings are also spaced at varying distances throughout its length. Short pieces of tape or cord are tied to each ring (fig. 5-1). In mine laying, these pieces are stretched out perpendicular to the main cord, alternately to the left and right. The metal ring tied to the end of each short cord marks the

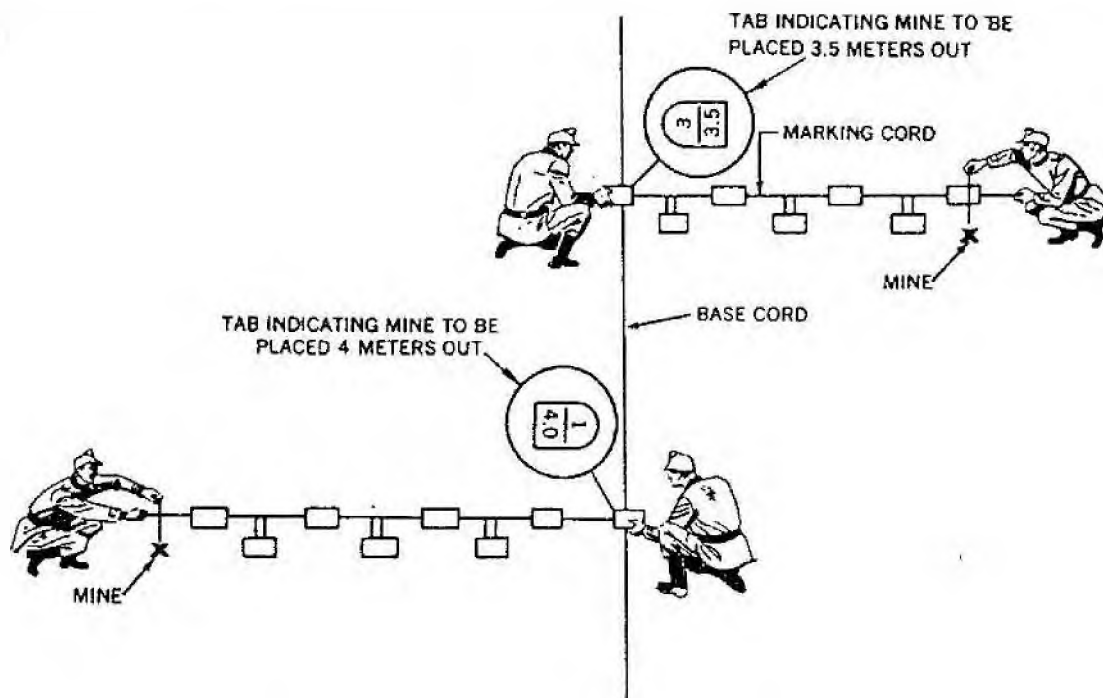


Figure 5-2. Soviet method of marking the location of mines.

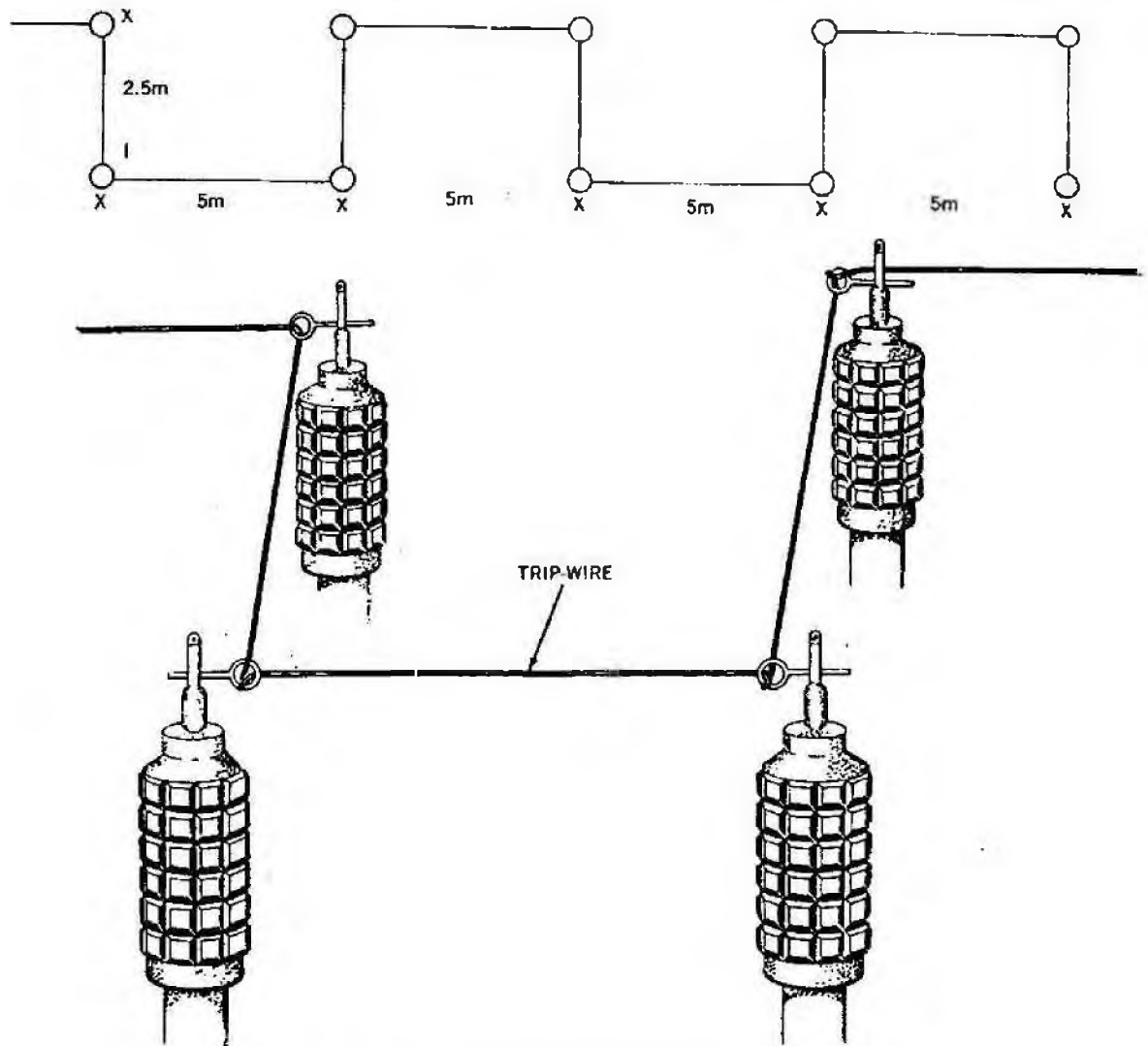


Figure 5-3. Soviet laying pattern for trip wire mines.

location for a mine. Metal pins are used to fasten the cord to the ground.

(2) *Base cord and marking cord.* The base cord and marking cord method (fig. 5-1) requires a base cord 30.5 to 50 meters long (with 15 numbered tabs tied at various intervals) and a marking cord 7.5 to 10 meters long (with markers tied at each meter and 0.5 meter length). The base cord is staked out in the same way as the spacing cord described above. Two engineers stretch out the marking cord perpendicular to the base cord to the distance indicated on the first tab (fig. 5-2), which marks the location for a mine. They then move the cord up to the second tab and stretch it out perpendicular to and in the direction from the base cord indicated by the tab. The consecutively numbered tabs on the base cord are

then laid with the even numbers to the left and the odd to the right.

(3) *Laying pattern for trip wire mines.* Figure 5-3 shows a laying pattern for trip wire mines.

5-5. Mine Density and Effectiveness

a. *Antitank Minefield.* Soviet antitank minefields contain between 750 and 1,000 tank disabling mines per kilometer of front. Minefields are installed in depth with the first belt placed at the maximum effective range of defending antitank weapons. The entire minefield is covered by protective fire. When a 3-belt minefield is emplaced at a density of 750 antitank mines per kilometer of front, a hit and kill probability of 70 percent is anticipated.

SYMBOLS

	ANTITANK MINE
	CONTROLLED MINE
	MINE WITH EXTRA CHARGE (ADDITIONAL CHARGE OR A CHARGE OF INCREASED POWER)
	INCENDIARY (NAPALM) MINE
	PRESSURE ACTION ANTIPERSONNEL MINE
	PULL ACTION ANTIPERSONNEL MINE
	ANTIPERSONNEL FRAGMENTATION (BOUNDING) MINE
	GAS MINE
	ILLUMINATION-SIGNAL MINE (FLARE)
	MINE OF UNKNOWN DESIGN
	ANTIDISTURBANCE ANTITANK MINE
	BOOBY TRAP
	COASTAL MINE
	COUPLED ANTIDISTURBANCE ANTITANK MINE
	LANE THROUGH OBSTACLE FOR MOTOR VEHICLES
	LANE THROUGH OBSTACLE FOR INFANTRY

Figure 5-4. Soviet minefield recording symbols.

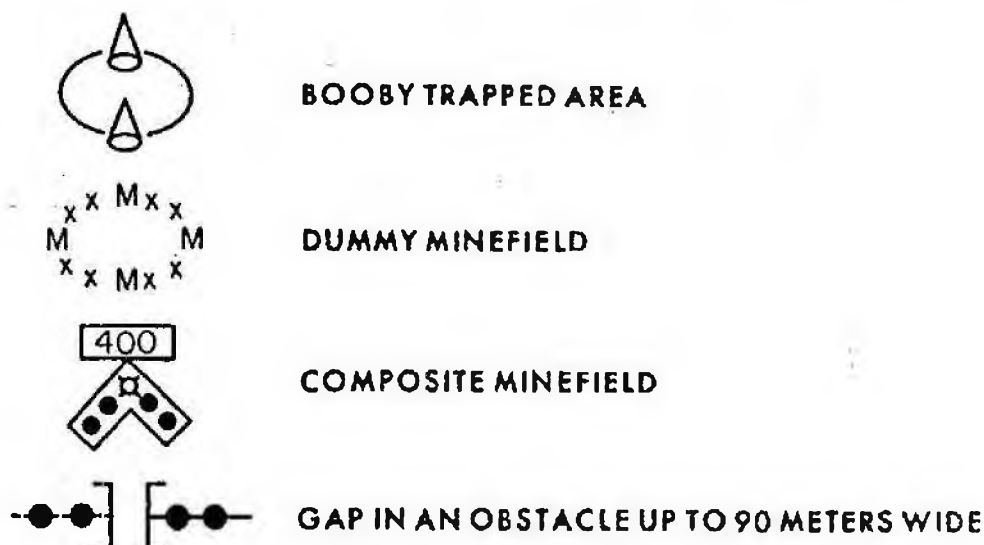


Figure 5-4—Continued.

b. Antipersonnel Minefields. Antipersonnel minefields have a density of approximately 2,000 mines per kilometer of front. Between 200 to 400 of these mines are trip-wire activated. Antipersonnel mine fields, used primarily in conjunction with natural barriers, are covered by fire.

5-6. Mine Requirements and Terrain Characteristics

The number of mines generally used in planting rugged terrain and cultivated and populated areas is tabulated below.

a. Rugged Terrain.

Characteristics	Number per kilo (1000m) of front	
	Antitank AT	Antipersonnel AP
Main direction of approach of enemy tanks—two roads in open country ----	1000	1000
Same in wooded swampy areas -----	500	1000
Steppe country—passable to tanks but not main avenues of approach -----	500	1000
Same in wooded swampy areas -----	200	500
Woody swampy areas difficult for tanks to pass through: 1 road -----	100	500

b. Cultivated and Populated Areas.

Characteristics	Number per kilo (1000m) of front	
	Antitank	Antipersonnel
Main direction of enemy tank approaches along highways -----	2100	2000
Possible approaches passable for tanks including secondary road net -----	1000	1000
Open terrain with one secondary road -----	300	1000

5-7. Minefield Marking and Recording

Forward area minefields normally are not marked. Rear area fields have lanes and boundaries marked. Locations of all mines are carefully recorded. Figure 5-4 shows Soviet minefield symbols.

5-8. Minefield Mark

In order to prevent casualties among friendly troops, rear area minefields, after laying, are usually marked by barbed wire and signs. No rigid standard methods are used, however. Blazes and paint marks are made on trees and broken branches are left on bushes. Other devices are heaps or lines of stones, single-stranded barbed wire fence, small shallow ditches 5 to 10 centimeters deep, and small low wire obstacles not over 0.76 meters high. Most of these markers are located on the friendly side and along the left and right boundaries.

5-9. Minefield Recording

a. Locations. The Soviet keep elaborate records of mine locations, carefully noting datum and reference points, limits, lanes, azimuths, lengths of row centerlines, and other pertinent traces. They also record the location of special boobytrapped mines, the type and number of mines used, a sketch of the minefield, and a diagram of the spacing cord. Locations of mines in front of the main line of resistance are usually surveyed by the eye; but when there is no enemy fire, they are accurately recorded by the use of a compass, transit, or measuring tape. The limits of minefields are tied in with at least two basic reference points (topo markers), which appear on the map. Also two local reference points (auxiliary markers) are used chiefly to help in laying minefields and in their removal. If topographical markers are absent in the immediate area, a distant one is tied in by means of auxiliary markers, and if there are no auxiliary markers, artificial ones, such as stone piles and shallow ditches, are used.

b. Boundaries. The boundaries or limits of each row and lane and the position of each mine are usually recorded. If mine spacing cords are used, individual mines inside the boundary are not indicated; instead an exact sketch with specifications of the spacing cord is included. The Soviets record all mines emplaced outside of minefields with the exception of isolated antipersonnel mines and antitank mines put down under enemy fire. The information includes the type of mines, their number, their appropriate position in groups of rows, and the exact position of each antipersonnel mine in a mixed minefield. All boobytraps and activated mines of the delayed action type—unremovable, controlled, and laid individually—are recorded separately.

c. Topographical Map. Included also in the record are a 1:50,000 or 1:20,000 scale topographical map on which all minefields are marked and numbered, a 1:25,000 or 1:10,000 scale diagram showing the tie-in of the minefield with reference points, and a 1:10,000 scale detailed plan. They are provided with a legend with data similar to that of United States Army Records.

d. Responsibility. When a unit is relieved of the responsibility of a minefield, all records are transferred to the newly assigned unit and the action is recorded. All minefield records are destroyed if capture by the enemy is imminent.

5-10. Detection

While selected Soviet Army personnel undergo intensive training in detecting mines and explosive barriers, all troops are taught to observe uneven ground surfaces, tracks, wires or strings, and tools or other objects lying in an area suspected of containing explosive devices. The use of probes and electronic mine detectors is stressed and engineer personnel are taught to use mine detectors either from a standing or prone position.

5-11. Mine Detection Reconnaissance

a. Methods. The Soviets, like the other combatants, use all available resources to detect minefields, as follows:

- (1) Combat reconnaissance by combined arms and special engineer reconnaissance groups.
- (2) Engineer observation from the forward edge of the enemy's defenses prior to and during attack.
- (3) Interrogation of local inhabitants, partisans, and prisoners of war.
- (4) Captured enemy documents.
- (5) Secret agents.
- (6) Air reconnaissance by observation and aerial photography.
- (7) Reconnaissance data from all combat arms.

b. Reconnaissance Troops. Soviet reconnaissance troops, when possible, are selected from among the most experienced and capable combat engineers. They are supported by other combat engineers that install markers and perform other nontechnical tasks.

c. Reconnaissance Functions. Minefield reconnaissance missions are usually assigned to parties, whose function is to ascertain the—

- (1) Pattern and extent of mine obstacles.
- (2) Location of individual mines.
- (3) Type of mine obstacles found (antitank or antipersonnel, minefield, boobytraps, delayed action or automatic mines, and others).
- (4) Safe approaches to the minefield.
- (5) Weak points in obstacles and the location of lanes and bypasses.
- (6) Fire plan used to cover the minefield.
- (7) Types of mines used by the enemy.
- (8) Enemy minelaying techniques.

d. Party Organization. The ideal reconnaissance group consists of 5 to 10 combat engineers com-

manded by a junior officer. For security they are armed with two or three automatic rifles and one or two light machine guns. The division engineer or the engineer battalion commander usually assigns the mission. Two or three reserve reconnaissance groups are attached to the engineer company commander.

e. Reports. These reconnaissance groups locate mine obstacles deep in enemy rear areas. All enemy minefields and mined obstacles discovered are plotted on a map at the time of reconnaissance. Complete reports with sketches are made on return from the mission. The results of the reconnaissance are immediately forwarded to the unit commander and used to determine the organization of mineclearing parties.

f. Equipment. Reconnaissance groups have available such equipment as mine detectors, stethoscopes, probes, markers, safety pins, grapnels, demolition blocks, detonating assemblies, wire cutters, flashlights, measuring tapes, and the like. The type and quantity carried depends on the mission.

5-12. Minefield Maintenance

a. Inspection. Minefields are periodically inspected by regimental engineers for damage by enemy fire, seasonal weather changes, and other deteriorating circumstances. Mines buried for a long period in the ground are frequently damaged by moisture, especially if the waterproof seals are broken. Fuzes become rusted and the explosives deteriorated or washed away.

b. Spot-Checks. Minefields are usually spot-checked after the first spring thaw, before the first autumn frost, and periodically during the year for existence and placement, correctness of pattern and camouflage, lanes, reserve supply of mines, and security of boundaries. Concealment and position of mines, especially during melting snow or after a heavy rain or flood, are noted. Checks are also made to determine whether individual mines or fuzes need replacement, the minefield should be reinforced, or a new minefield should be laid. The results of the inspection and the restoration or reinforcement action are entered on the record form.

c. Mine Reconditioning. Faulty fuzes in anti-tank mines are replaced on the spot in mines still functionable. On the other hand some mines with unserviceable fuzes are activated by placing two other mines on top. Fuzes of mines run over by vehicles or subjected to mortar or artillery fire,

but not detonated, are either detonated in place or removed from a covered position by a hook and rope. Damaged minefields are frequently reinforced by laying new rows where needed or entirely new fields are laid.

5-13. Breaching Principles

The Soviet Army recognizes that explosive barriers will be encountered in the path of advancing troops and acknowledges the impossibility of bypassing all of these barriers because of tactical and terrain conditions. Therefore, the Soviets provide within troop units for both breaching and removal procedures for which their troops are trained in the techniques of breaching explosive barriers by hand, explosive, and mechanical methods. Visual and hand-probe methods are used along the forward edge of the battle area (FEBA), covertly and under camouflage, while the personnel doing the clearing are covered by protective fire. The same procedures may be employed when detailed information is required on the types of mines and explosive charges in a minefield. If time is short and there is no requirement for security, the explosive means of breaching is used without previous reconnaissance. When extensive barriers are encountered in frontage and depth, mechanical methods of breaching are ordered.

5-14. Minefield Breaching Techniques

a. Methods Employed. Depending on the tactical situation, available time, and equipment; minefields may be cleared by hand, by explosive means, or by mechanical equipment. Lanes through the mine fields along the forward edge of the battle area are cleared by hand. These operations are carried out covertly under camouflage and often at night. The clearing personnel, specially trained engineers, are protected by covering fire throughout the entire period. If there is no requirement for surprise, mines are removed using grapnels or exploded in place by use of a small demolition charge.

b. Responsibility. This task is performed by engineer breaching parties and combat engineer units attached to infantry. The number of lanes cleared and their width depends on the type of unit (infantry or armored) using the lane, the deployment of attacking units, and the battle plan. Safety zones are cleared on both sides of all lanes. For security reasons, breaching activities are usually carried on at night on the eve of the of-

ensive. In each lane of attack in an infantry regimental sector, an engineer officer from the mine-breaching unit is designated as the commandant. He is subordinate to the regimental commander and directed by instructions from the division engineer. His responsibilities are to clear the lane; to guard, work, and maintain it; to control most of the friendly troops and vehicles that pass through; to plan and execute all widening work; to make available the necessary reserve personnel and close it in the event of enemy counterattack; to mark the limits of the minefield; and to provide security guards until relieved by the unit responsible for the general mine clearing of the area.

c. *Locating Mines.* Mines are located by visual inspection, electronic detection, and probing. Special stethoscopes are required for locating clock mechanisms used in delayed action mines. The electronic detector is carried by the leader of the breaching party and is operated from the prone position if the minefield is under enemy fire or located in front of the main line of resistance. Otherwise it is operated from the standing position. Probes are used to detect nonmetallic mines or mined areas covered with shrapnel or metallic debris where the operation of electronic devices is impractical. The user holds the probe at an angle of less than 45° and pierces the ground every 10 to 15 centimeters.

d. *Explosive Methods.* In the hasty breaching of lanes, explosive methods are sometimes employed. One of these consists of an 11-pound charge fixed on a tripod 0.5 to 4.1 meters above the ground, the blast of which explodes pressure actuated mines within a radius of 4.5 meters. Detonating cord nets are also used to explode pressure-actuated mines. Blocks of TNT lashed to boards, forming an elongated charge, are exploded, clearing a lane approximately 0.91 meters wide.

e. Breaching by Artillery Fire.

(1) *First phase.* Artillery breaching consists of two phases—fire reconnaissance and fire destruction. In the *first phase* a heavy battery, firing high explosive ammunition with quick fuze, combs through the entire suspected area to determine the parameters of the minefield. The battery hurls a parallel sheaf of fire at an elevation jump of one probable error. Two volleys are fired at each sight setting; and careful observation is made for signs of sympathetic detonations.

(2) *Second phase.* After the boundaries of the minefield and those of the desired gap have

been determined, destruction, or the *second phase*, is begun. Here the Soviets use heavy or very heavy howitzers if they are available. The sheaf or cone of fire is concentrated within a maximum width of 9.1 meters. Ricochet fire is used with the burst no higher than 9.1 meters above the ground. An angle of impact, ranging from 18° to 20° gives the most satisfactory results. Bombardment is conducted at one sight setting, with the observation of each volley, until there is no evidence of sympathetic mine detonation. Bombardment is repeated at the next site elevation until the gap is cleared. In the absence of medium or heavy howitzers, intermediate howitzers or even light guns are sometimes used with high-explosive ammunition with quick fuze.

(3) *Ammunition requirements.* The Soviet artillery blasting method requires 450 to 500 rounds fired from 76-mm guns to give the same results as 60 rounds from a 203-mm howitzer. The time required to detonate a lane 6 to 8.5 meters wide through a 100-meter minefield using various types of artillery is as follows:

Caliber	Number rounds required	Time required	
		1-piece battery	4-piece battery
203-mm howitzer -----	60	2 hrs 35 min	25 min
162-mm gun-howitzer ---	120	3 hrs	22 min
152-mm howitzer -----	120	2 hrs	14 min
122-mm gun -----	160	2 hrs 50 min	25 min
122-mm howitzer -----	160	2 hrs	12 min
76-mm gun -----	450-500	8 hrs	65 min

f. Other Breaching Methods.

(1) The Soviets make pressure type antipersonnel mines safe without removal by covering them with wooden boxes. Lanes through antipersonnel minefields are breached by driven tanks. Tripwire mines, however, are disarmed individually or exploded in place by means of grapnels.

(2) Electric fuzed mines are disarmed by their disconnection from the power source. Mines with antidisturbance fuzes or boobytraps, mines of unknown construction, and those that might explode at removal (having frozen fuzes, having been under artillery or mortar fire, or laid in the vicinity of craters) are either detonated in place or taken up by grapnels.

(3) Hasty breaching of mined fords is accomplished by blasts of 2- to 11-pound explosive charges which detonate sympathetically all mines within a 4.5-meter radius. Underwater mine clearing work is usually done by specially trained engineers provided with respirators, swim suits,

and stream-crossing equipment. Abatis are first partially cleared by demolitions and then pulled apart by grapnels or cables attached to trucks. Once breached, the gap is carefully rechecked for the presence of mines.

(4) The Soviets may use breaching methods that are wasteful of both human and animal life. Some forward armored formations are instructed to disregard enemy mines, as casualties are considered negligible in comparison with the advantages to be gained by the discovery of minefields that might then be cleared or breached. Also they may drive herds of cattle and other animals, civilian refugees, penal battalions, and even regular infantry across minefields to breach gaps for the safe passage of assault forces.

5-15. Minefield Clearing

After the assault breaching of minefields and obstacles to permit the advance of attacking units,

clearing operations are undertaken according to the following priorities:

a. All main supply roads and cross-country lines of march are cleared, with the initial goal of not less than one two-way road for each regiment. All places suspected of having delayed action mines are enclosed, if possible, with a marking system and detours around them are provided until the mines are inspected and removed.

b. On lateral roads and inhabited areas, prior to clearing, barricades, warning signs, and guards are placed at all access points.

c. Local Soviet authorities in occupied areas, as a rule, are responsible for notifying the local inhabitants of mined and cleared areas, for guarding marked mine areas, and for training instructor cadres (obtained from the militia, local MVD organizations, and mopping-up battalions) in mine clearing work.

Section II. MINE WARFARE METHODS OF OTHER EURASIAN COMMUNIST COUNTRIES

5-16. Resemblance to Soviet

Mine warfare as practiced in the Communist bloc countries closely resembles the techniques and doctrine taught and used in the Soviet Union. All of these nations have conducted individual development and have manufactured mines and fuzes. Czechoslovakia and East Germany are the only countries that have recently designed and produced mine detectors, mine planters, and minefield clearing equipment. However, these items all have been influenced by Soviet design.

5-17. Czechoslovakia

Czechoslovakia is one of the leading Communist countries in the production of mines and fuzes. It has conducted its own development program and has been self-reliant for supply of mines and fuzes. New mines and fuzes using modern design features have been standardized.

5-18. East Germany

East Germany has the industrial capability to produce mine warfare equipment in quantity. The

East Germans adhere to Soviet doctrine, training, and technique in mine warfare and have depended on the Soviets for mine warfare equipment in the past, but have produced the heavy AT mine, PM-60.

5-19. Hungary, Albania, and Poland

These countries also adhere to Soviet doctrine and technique in mine warfare operations. They do not conduct independent research and development on mines or associated equipment, but do produce components, such as plastic mine cases to Soviet specifications. Their current standard mine warfare equipment is of Soviet design and meets the requirements of their armies.

5-20. Yugoslavia

Although Yugoslavia is a Communist country it does not come under the Soviet sphere of influence to the extent of the other countries discussed above. Yugoslavia conducts its own research and development, and produces its required supply of mine warfare items. Surplus production is exported to Asiatic and African countries.

CHAPTER 6

MINES AND FUZES OF EURASIAN COMMUNIST COUNTRIES

6-1. Organization of this Chapter

Mines and fuzes are listed by country of manufacture. The countries are arranged in alphabetical order—Communist China, Czechoslovakia, and so forth. For each country, the mines and fuzes are listed in this order—antitank and antivehicle mines, antipersonnel mines, and, lastly, fuzes.

6-2. Mine, Antitank (Similar to Soviet TM-41) (Communist China)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 9.8" Height: 6"	8.65 lb	No data	No data	No data	No data

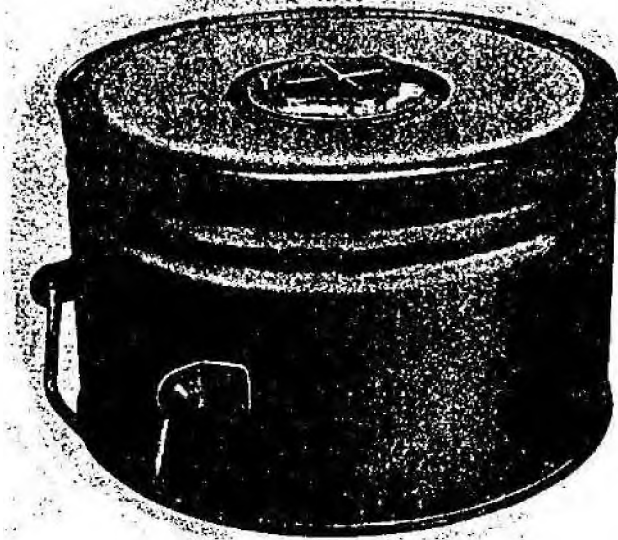


Figure 6-1. Mine, Antitank (Similar to Soviet TM-41).

a. General. The mine is fabricated of sheet metal. It consists of 3 pieces: the bottom, cylindrical body, and the top which contains a filler plug. Centrally located in the top of the mine is a threaded well to accept the fuze and the detona-

tor. The mine is similar in construction and material to the Soviet sheet metal antitank mine TM-41.

b. Use. This is an exact copy of the Soviet TM-41 mine and designed primarily for use as an antivehicular mine. Unless stacked it would be ineffective against tanks and armored vehicles.

c. Functioning. This mine is probably fuzed with a Communist Chinese universal fuze which can be activated by either pull or pressure action.

d. Installing and Arming. Remove the fuze-well plug and install a pressure-activated fuze when the mine is used as an antivehicular mine. By use of the universal fuze and a trip wire, the mine becomes effective as a blast type antipersonnel mine. (See Soviet Mine, antitank, TM-41.)

e. Disarming. To disarm the mine, remove the pressure spider and cover from the mine and fuze well respectively—then remove the fuze. If the mine is set for trip wire activation and fuzed with the Chinese Communist universal fuze, cut the trip wire, then remove the fuze from the fuze well, and replace the safety bar. (See Soviet Mine, antitank, TM-41.)

6-3. Mine, Dual Purpose, No. 4 (Communist China)

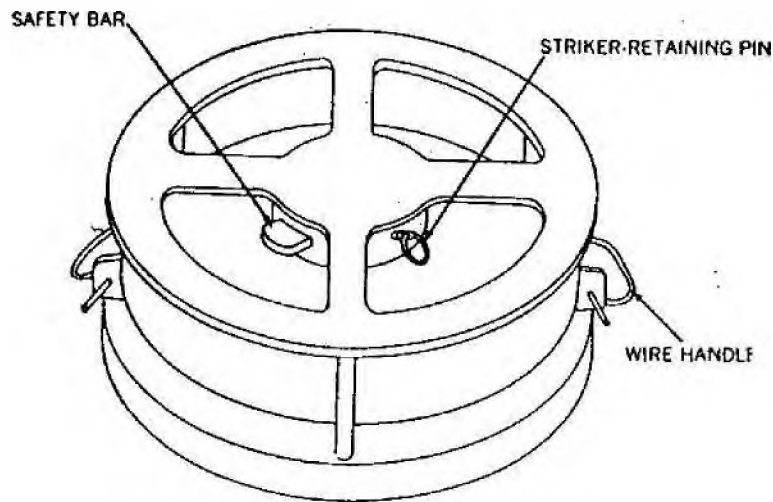


Figure 6-2. Mine, Dual Purpose, No. 4.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 8.9" Height: 8.9"	11.4 lb approx	Pressure/pull	300 to 500 lbs pressure; 10 to 50 lbs pull	4.5 lbs TNT approx	

a. *General.* This cast iron mine is used against foot troops and light vehicles. A threaded fuze well is located in the top-center of the mine. The mine has a pressure spider supported on three legs. Without the pressure spider this mine resembles the obsolete United States antitank mine M-1.

b. *Use.* This mine may be used for an anti-vehicular or antipersonnel purposes.

c. *Functioning.*

(1) *Pressure.* Pressure on the spider is transferred to the top of the fuze. It shears the striker

retaining pin and releases the spring loaded striker against the percussion cap, firing it, the detonator, and the main charge.

(2) *Pull.* Pull on the pull ring of the striker retaining pin pulls it from the fuze, releasing the spring loaded striker against the percussion cap, firing it and in turn the detonator and main charge.

d. *Installing and Arming.*

(1) Unscrew the fuze well plug.

(2) Test the fuze by attempting to remove the safety bar. If the fuze has been fired, it cannot be removed.

(3) Insert the detonator in the fuze and screw the fuze (detonator end) into the fuze well.

(4) Adjust the spring tensioning screw on the top of the fuze for the pull desired. The screw should be turned at least four full turns.

(5) Place the spider on the mine. Turn the spider in a clockwise direction until the spider arms engage the locking lugs on the side of the mine.

(6) Attach a trip wire to the striker retaining pin of the fuze, if pull operation is required.

(7) Carefully remove the safety bar from the side of the fuze.

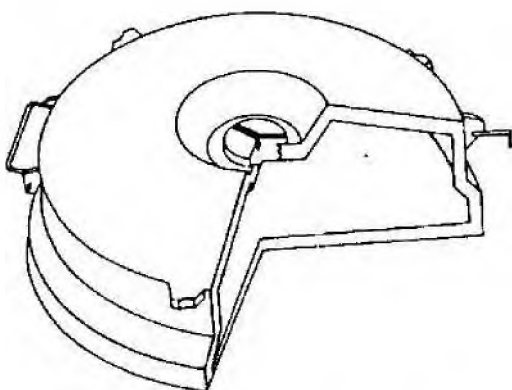


Figure 6-3. Mine, Dual Purpose No. 4.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Cut any slack trip wires found attached to the mine fuze.

(3) Carefully remove the pressure spider.

(4) If the safety-bar is still in the fuze, push it on in. DO NOT DISTURB THE STRIKER RETAINING PIN WHEN PERFORMING THIS OPERATION. If the safety bar cannot be pushed in, the fuze has probably been fired.

(5) Carefully remove the fuze from the mine.

(6) Separate the percussion cap and detonator from the fuze.

(7) Transport the mine and fuze to a safe storage or disposal area.

f. Precaution. If the fuze appears to have been fired, do not attempt to separate the percussion cap and detonator from the fuze, as the striker may be impinged in the percussion cap. *Destroy the fuze immediately.*

6-4. Mine, Antipersonnel, PMD 6 (Communist China)

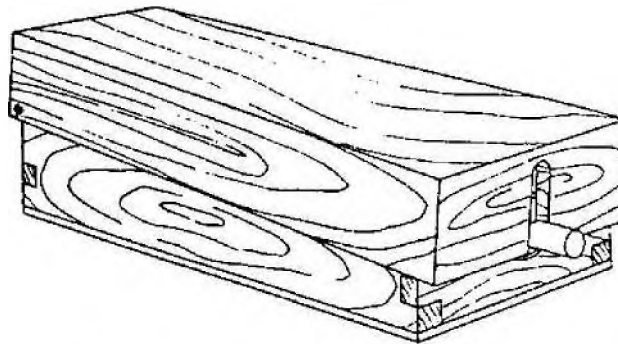


Figure 6-4. Mine, Antipersonnel, PMD 6.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter:			Same as Soviet PMD-8 See paragraph 6-59		
Height:					

6-5. Mine, Antipersonnel, Shrapnel, Model POMZ-2 (Communist China)

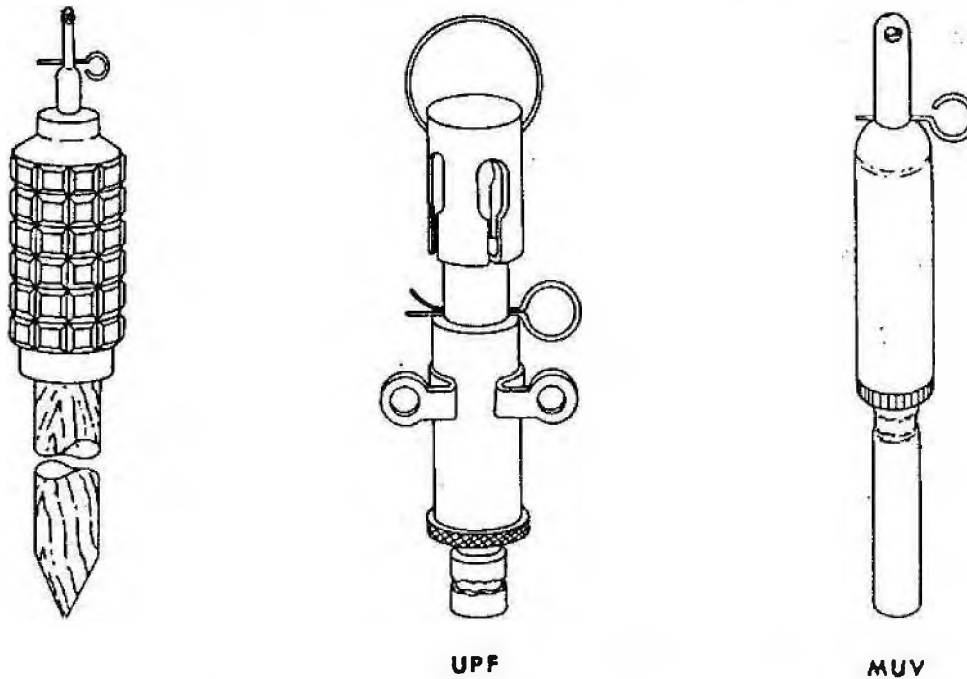


Figure 6-5. Mine, Antipersonnel, Shrapnel, Model POMZ-2.

Dimensions	Wt	Fuz	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.3" Height: 4.1"	3.1 lb. approx	MUV Pull or UPF	20 to 40 lb	2.6 oz cast TNT	N/A

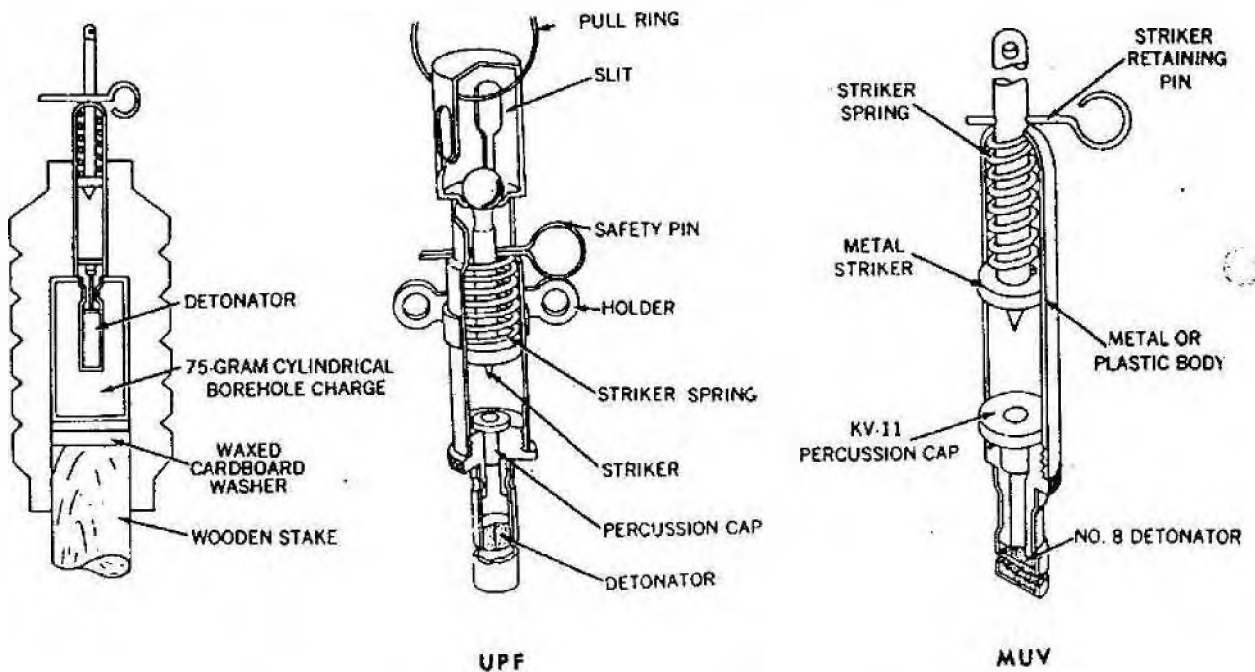


Figure 6-6. Mine, Antipersonnel, Shrapnel Model POMZ-2.

a. *General.* This mine is a copy of the Soviet POMZ-2M. It consists of a wooden stake, a serrated cast iron body, a cylinder of cast TNT, and a pull-actuated fuze. It has an effective fragmentation radius of 20 meters.

b. *Use.* This mine is emplaced above the ground in high grass, bushes, or in woods.

c. *Functioning.* A pull on the tripwire removes the pull pin in the fuze, releasing the striker to fire the percussion cap and detonate the mine.

d. *Installing and Arming.*

(1) Drive the stake approximately 5 inches into the ground.

(2) Insert the charge into the case and drive the case onto the stake.

(3) Screw the fuze into the fuze well and attach the anchored tripwire to the pull ring.

e. *Disarming.*

(1) Check tripwire from mine to anchor for small mines or boobytraps.

(2) Cut the tripwire.

(3) Unscrew the fuze from the fuze well.

(4) Remove the mine, stake, and fuze to a safe storage or disposal area.

6-6. Fuze, Pressure/Pull (ChiCom Universal Fuze) (Communist China)

Dimensions	Case	Internal action	Operating force
Diameter: 1.7" Height: 2.4"	Brass	Pressure, mechanical, with shear pin release; pull with pull pin release.	300 to 500 lb pressure; 10 to 50 lb. pull.

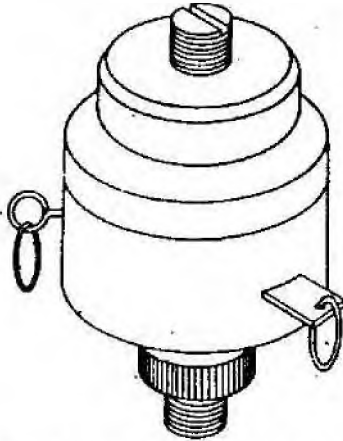


Figure 6-7. ChiCom Universal fuze.

a. General. This mechanical fuze has a brass case. The striker spring compression is increased or decreased by a tensioning screw in the top of the fuze. To prevent accidental firing, a wide flat safety bar is inserted between the percussion cap and the striker. The safety bar cannot be removed when the striker is in an uncocked position. A brass shipping cap is placed on the threaded base.

A variation of this fuze has a setting collar with the figures 1 and 2 marked on it. The collar is set on 1 for pressure, and on 2 for pull.

b. Use. This fuze is used in the dual-purpose mine No. 4.

c. Functioning. Pressure on the top shears the retaining pin or a pull on the striker retaining pin releases the striker to fire the percussion cap.

d. Installing and Arming.

(1) Test the fuze by attempting to remove the safety bar. If the fuze has been fired it cannot be removed.

(2) Insert a detonator in the detonator percussion cap holder and screw into base of the fuze.

(3) Tighten the screw provided to lock the detonator percussion cap holder to the base of the fuze.

(4) For pressure, screw the fuze into the mine and remove the safety bar.

(5) For pull, position the fuze in the mine and adjust the tensioning screw for the pull desired. A pull of 10 to 50 pounds may be obtained by screwing the spring-tensioning screw for

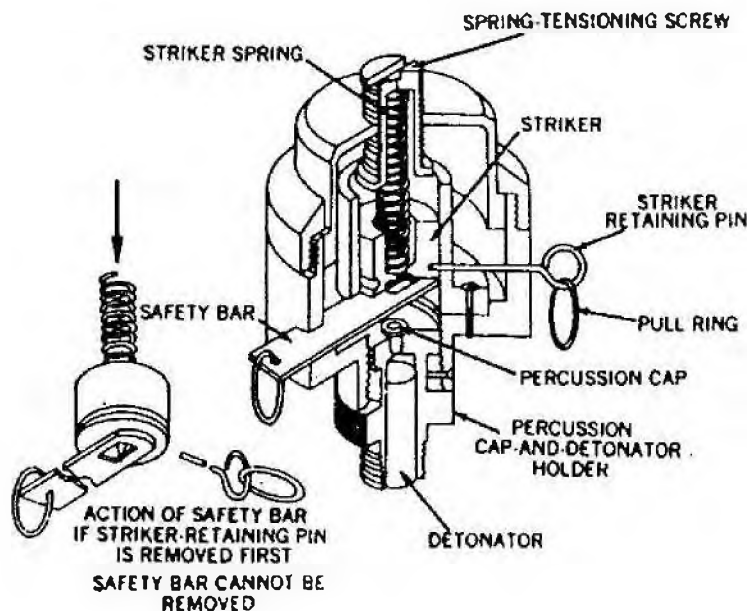


Figure 6-8. ChiCom Universal fuze.

greater pull and unscrewing it for lesser pull. Remove the safety bar.

e. Disarming.

(1) Cut any slack trip wires and insert the safety bar in the slot in the side of the fuze. *Do not disturb the striker retaining pin when performing this operation!* If the safety bar cannot be pushed in, the fuze has probably been fired.

(2) Loosen the locking screw in the base of the fuze and unscrew the percussion cap and detonator holder from the base.

f. Precaution. If the fuze appears to have been fired, do not attempt to separate the percussion cap and detonator from the fuze, as the striker may be impinged in the percussion cap. *Destroy the fuze immediately.*

6-7. Mine, Antitank, Metallic, Model PT-Mi-K (Czechoslovakia)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.7" Height: 8.9"	15.8 lb	RO-5 or RO-9, pressure	600 to 800 lb.	11 lb TNT	3.5 oz Toul (like tetryl)

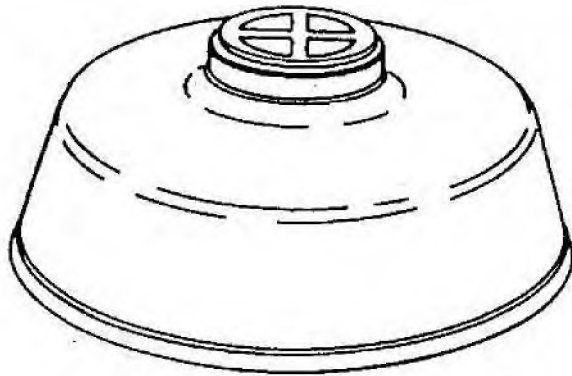


Figure 6-9. Mine, Antitank, Metallic, Model PT-Mi-K.

a. General. This metallic mine has an open type pressure plate fashioned like a wheel with four spikes and held in place by shear pins passing through the collar on the case. These specially designed pressure plate and shear pin supports provide resistance to actuation by over-pressure from nuclear weapons explosions.

b. Use. This antitank mine is designed for mechanical laying.

c. Functioning. Force on top of the pressure plate ruptures the shear pin and releases the fuze striker to fire the mine.

d. Installing and Arming.

- (1) Remove the pressure plate.
- (2) Place an RO-9 fuze with integral detonator and booster charge in the mine.
- (3) Replace the pressure plate.

e. Disarming.

- (1) Check for and remove any secondary fuze or antilift devices.
- (2) Carefully remove the shear pins from the collar on the mine case.
- (3) Carefully lift the fuze from the mine.
- (4) Separate the percussion cap, detonator, and booster from the fuze, if possible.
- (5) Transport the mine and fuze to a safe storage or disposal area.

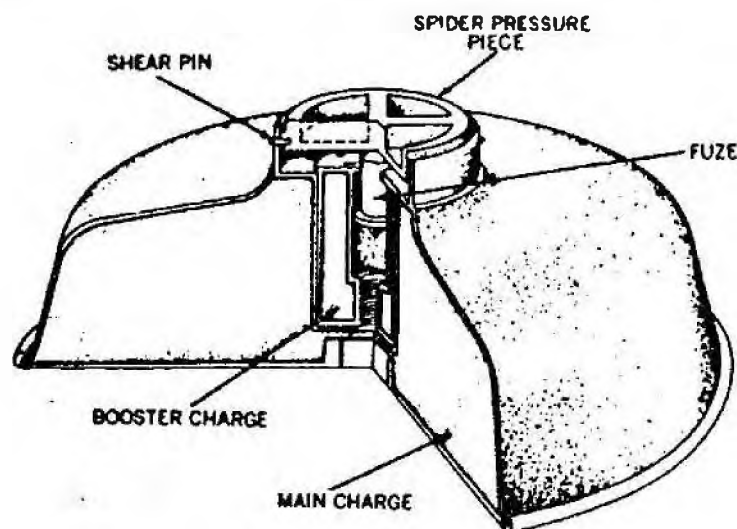


Figure 6-10. Mine, Antitank, Metallic Model PT-Mi-K.

6-8. Mine, Antitank, Nonmetallic, Model PT-Mi-Ba (Czechoslovakia)

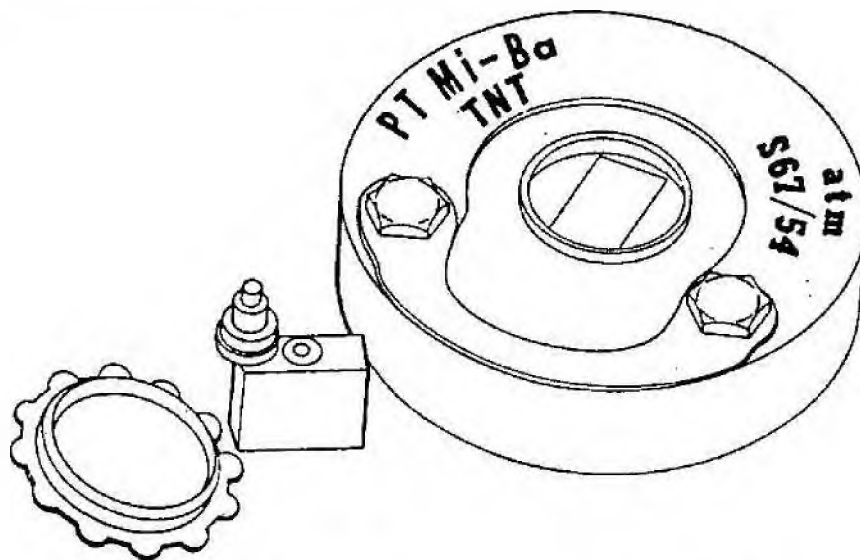


Figure 6-11. Mine, Antitank, Nonmetallic, Model PT-Mi-Ba.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12.8" approx Height: 8.9" approx	16.8 lb	RO 7-11 pressure	500 lb approx	12 lb cast TNT	7 oz TNT

a. *General.* This mine consists of a case made of two bakelite mouldings cemented together. The fuze well is closed by a threaded cover plate; and the two filler holes in the bottom of the case, by two lugs. It is detonated by a plastic-bodied RO 7-11 pressure fuze.

b. *Use.* This model is used in minefields and obstacles.

c. *Functioning.* Force on the pressure plate ruptures the shear groove, puts pressure on the fuze, and thus activates the detonator and starts the firing chain.

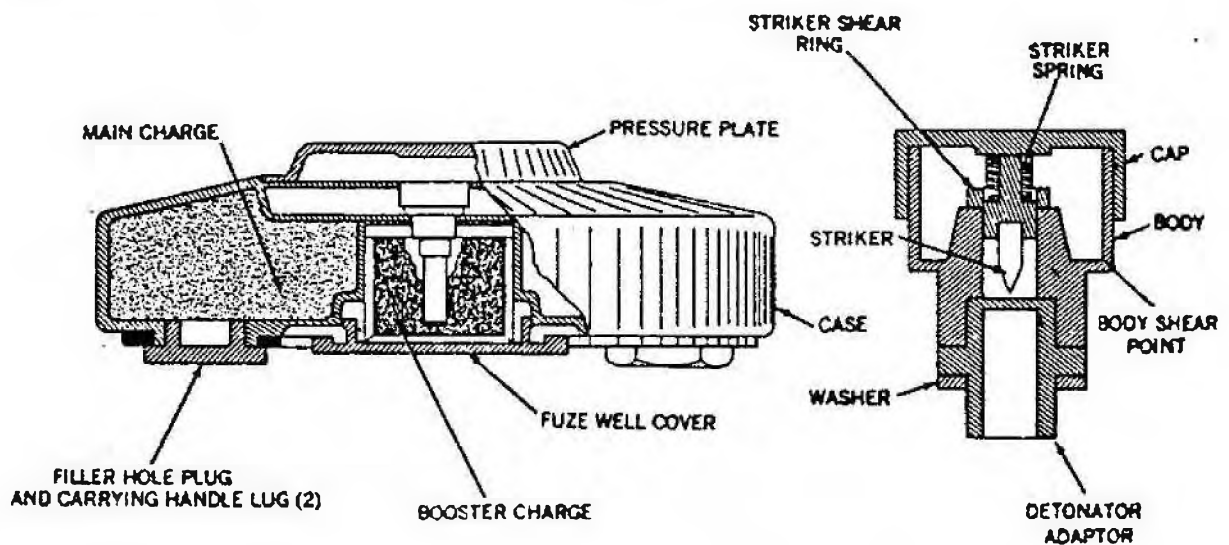


Figure 6-12. Mine, Antitank, Nonmetallic, Model PT-Mi-Ba.

d. Installing and Arming.

(1) Turn the mine upside down and remove the fuze well cover.

(2) Remove the base of an RO 7-11 fuze and insert the detonator.

(3) Replace the base of the fuze with the detonator attached.

(4) Screw the fuze and detonator assembly into the threaded plastic well in the booster charge.

(5) Place the assembled fuze, detonator, and booster, fuze first, into the fuze well (with the

mine inverted for arming, the fuze should be down).

(6) Replace fuze well cover.

(7) Turn the mine over, top side up.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Remove the fuze well cover and pull out the fuze and booster.

(3) Unscrew the fuze from the booster and the detonator from the fuze.

(4) Remove the mine and fuze to a safe storage or disposal area.

6-9. Mine, Antitank, Cardboard, TQ-Mi (Czechoslovakia)

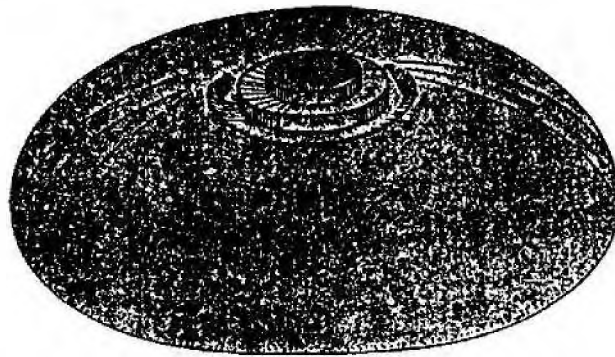


Figure 6-13. Mine, Antitank, Cardboard, TQ-Mi.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.2" Height: 5.9"	2.2 lb	Pressure chemical	705.5 lb	TNT 11.5 lb.	3.5 oz Toul

General. The mine case is made of cardboard. The fuze body is of glass and contains phosphorus.

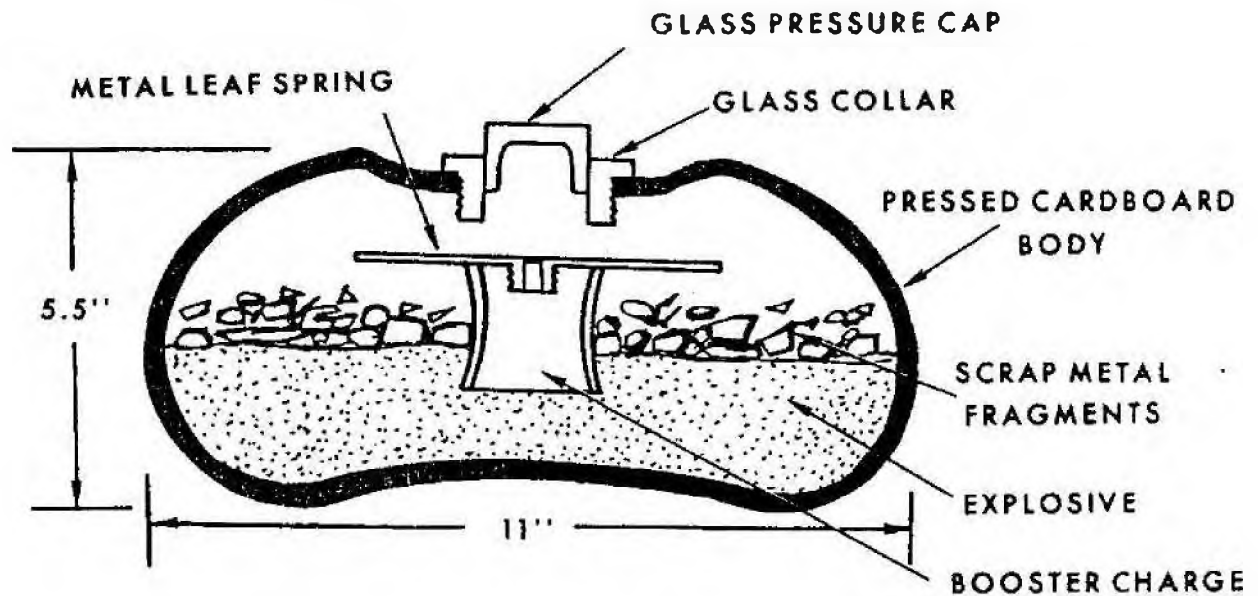


Figure 6-14. Mine, Antitank, Cardboard TQ-Mi.

6-10. Mine, Antitank, Nonmetallic, NA, MI, BA (Czechoslovakia)

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: 7.8" Height: 9.8"	No data	Mech. Chem.	4.9 lb	Tritol 5.8 lb	No data

General. The mine is laid by hand. It is circular in shape and made of bakelite.

6-11. Mine, Antipersonnel, Bounding, Model PP-Mi-Sr (Czechoslovakia)

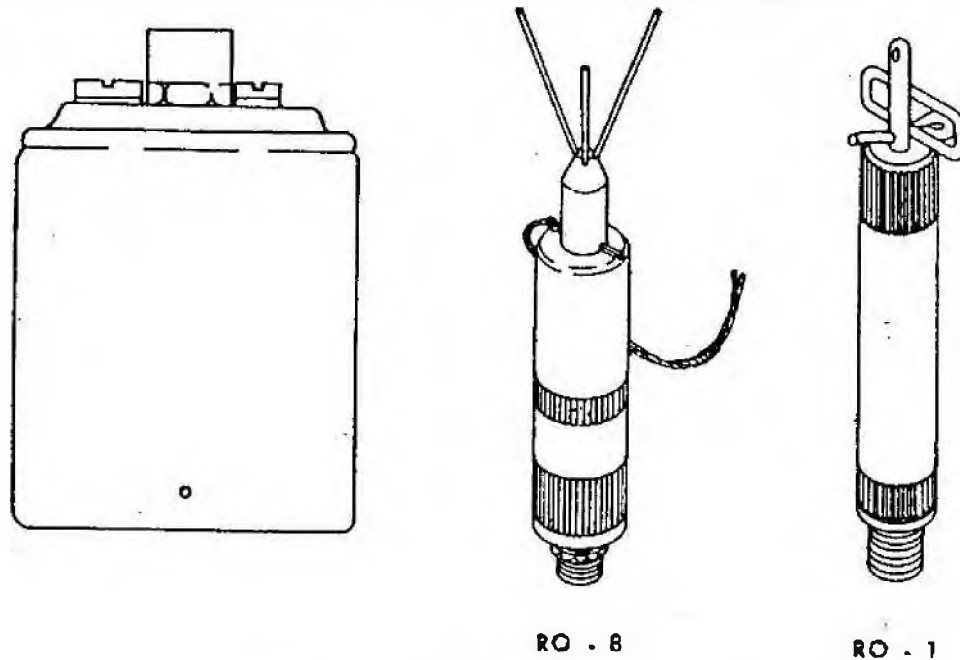


Figure 6-15. Mine, Antipersonnel, Bounding, Model PP-Mi-Sr.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 8.9" Height: 5.4"	7.1 lb	RO-8 pressure or RO-1 pull	10 lb approx with RO-8 fuze	12 oz TNT	37 gr black powder.

a. General. This metallic antipersonnel mine has a centrally located fuze well with a transit

cap. On the opposite sides of the fuze well are the filler and detonator well plugs. The body of the

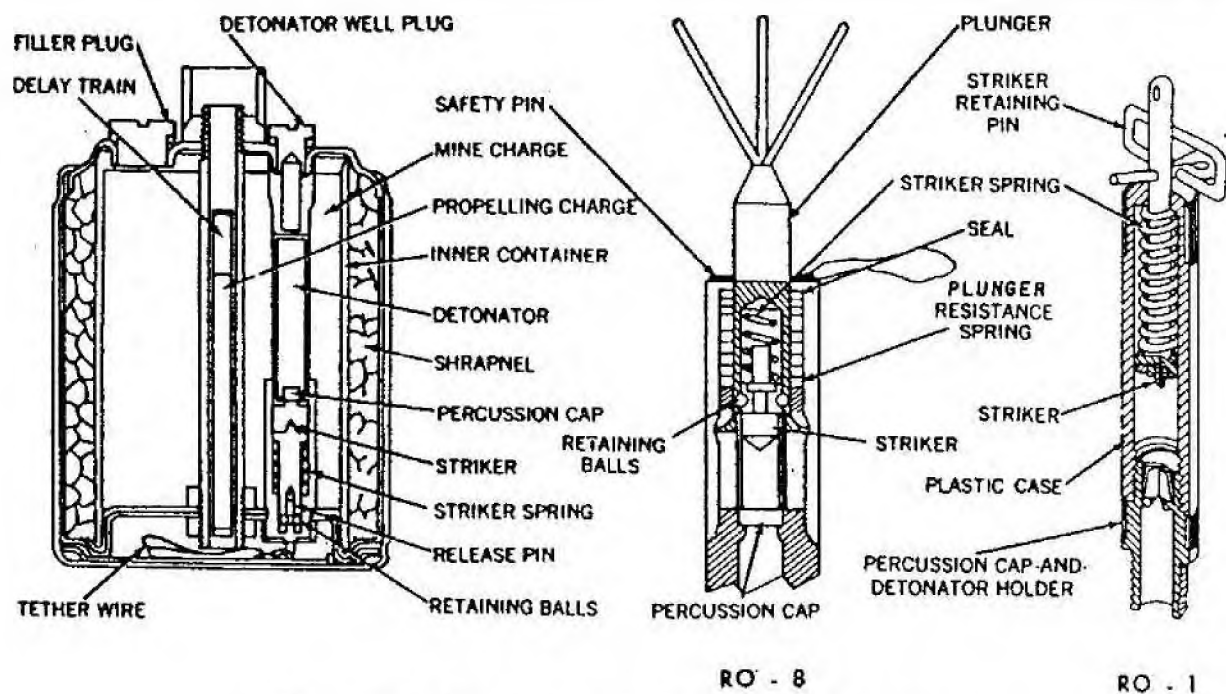


Figure 6-16. Mine, Antipersonnel, Bounding, Model PP-Mi-Sr.

mine fits into an outer casing that also contains the propelling charge. Shrapnel made of short pieces of steel rod are contained between the inner and outer walls of the mine body. The mine is fitted with a delay train. The effective fragmentation radius of this mine is 20 meters.

b. Use. This antipersonnel mine is laid in antipersonnel minefields, with antitank mines in minefields, or along possible enemy routes. It may be buried with only the end of the fuze exposed or placed on top of the ground with the container removed, in which case the igniter is usually an RO-1 fuze with a tripwire.

c. Functioning. The percussion cap is fired by pressure on the RO-8 fuze or pull on the RO-1 tripwire, which in both cases ignites the delay train. After 3 to 5 seconds the propellant charge ejects the body of the mine from the container taking with it a wire attached to the bottom of the container. When this wire becomes taut (the ejection has reached a height of approximately 1

meter off the ground), it activates the integral fuze, which fires the detonator and then the mine.

d. Unstalling and Arming.

- (1) Emplace the mine.
- (2) Remove the transit cap.
- (3) Screw an RO-8 or RO-1 fuze into the well.
- (4) If the RO-1 fuze is used, attach the anchored tripwire to the striker retaining pin.

e. Disarming.

- (1) Check for and remove any antilift devices.
- (2) Trace and cut any slack tripwires.
- (3) Replace the safety pin.
- (4) If an RO-8 fuze is used, unscrew the fuze.
- (5) Unscrew the detonator well plug.
- (6) Remove the detonator.
- (7) Remove the fuze and mine to a safe storage or disposal area.

6-12. Mine, Antipersonnel, PP-Mi-ST-46 (Czechoslovakia)



Figure 6-17. Mine, Antipersonnel, PP-Mi-ST-46.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.8" Height: 6.8"	3.6 lb	Pull or pressure	2 lb or more	TNT 2.6 oz	none

a. General. The case is made of cast iron. The mine has a detonator.

b. Use. Normally used as a stake mine in grassy or brushy areas.

c. Functioning. A force of 2 lb or more removes the striker-retaining pin. The spring-loaded striker falls on and fires the percussion cap and detonator that set off the main charge.

d. Installing and Arming.

- (1) Drive stake into the ground.
- (2) Place charge in case and mount on stake.
- (3) Place a detonator in mine.
- (4) Insert an RO-1 fuze in mine.
- (5) Attach an anchored tripwire to striker-retaining pin.

e. Disarming. Reverse of arming procedure.

6-13. Fuze, Pull-Mechanical, Model RO-1 (Czechoslovakia)

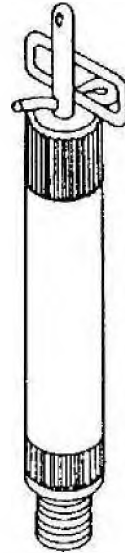


Figure 6-18. Fuze, Pull-Mechanical, Model RO-1.

Dimensions	Case	Internal action	Operating force
Diameter: 0.5" Length: 3.4"	Plastic	Pull, mechanical with pin release	2 lb. or more

a. *General.* This plastic cased RO-1 fuze is identical to the World War II German Model Z.Z. 42.

b. *Use.* This pull fuze is used with the PP-

Mi-Sr antipersonnel mine and the PT-Mi-D anti-tank mine.

c. *Functioning.* A pull on the loop or pressure on the wings of the striker retaining pin frees the spring-loaded striker to fire the percussion cap.

d. *Installing and Arming.*

(1) Pull the striker upward and place the retaining pin in the lower hole.

(2) Screw a detonator holder into the base of the fuze and slide the detonator into the holder.

(3) Install the fuze in the mine.

(4) Attach a tripwire, if desired, to the loop of the retaining pin.

e. *Disarming.*

(1) Cut any slack tripwires. (Taut wires must be checked first.)

(2) Remove the fuze from the mine.

(3) Unscrew the detonator holder from the fuze.

(4) Slip the detonator from the holder.

(5) Remove the fuze to a safe storage or disposal area.

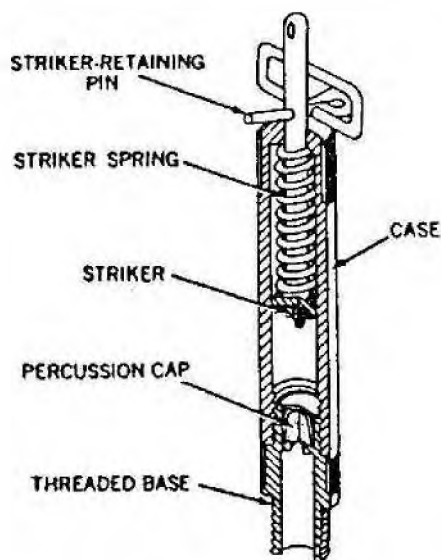


Figure 6-19. Fuze, Pull-Mechanical, Model RO-1.

6-14. Fuze, Pressure, Model RO-7-11 (Czechoslovakia)

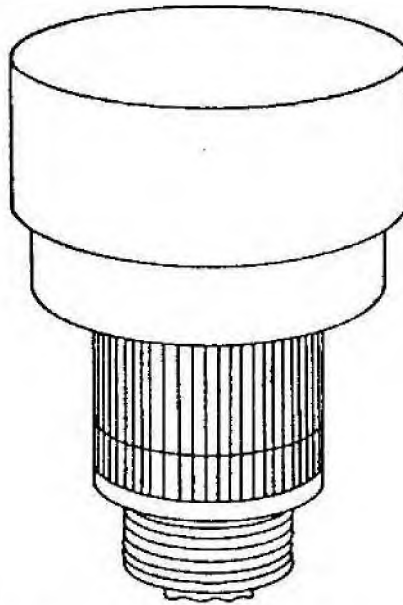


Figure 6-20. Fuze, Pressure, Model RO-7-11.

Dimensions	Case	Internal action	Operating force
Diameter: 1.2" Length: 8.5"	Plastic	Pressure, mechanical, with shear ring release.	800 to 500 lb.

a. General. The Model RO 7-11 fuze has a plastic body with a plastic cap cemented on the top. It has only two metallic parts—the striker point and the helical striker spring, which rests between the cap and the striker.

b. Use. This plastic-cased model is used as a pressure igniter in the PP-Mi-Ba bakelite anti-tank mine.

c. Functioning. A pressure load on the cap

causes the failure of the body shear point, compressing the striker spring and breaking off the striker shear ring, which releases the striker to actuate the detonator.

d. Installing and Arming.

- (1) Remove the detonator retaining collar.
- (2) Insert the detonator in the collar.
- (3) Screw the collar with the detonator back into the fuze.

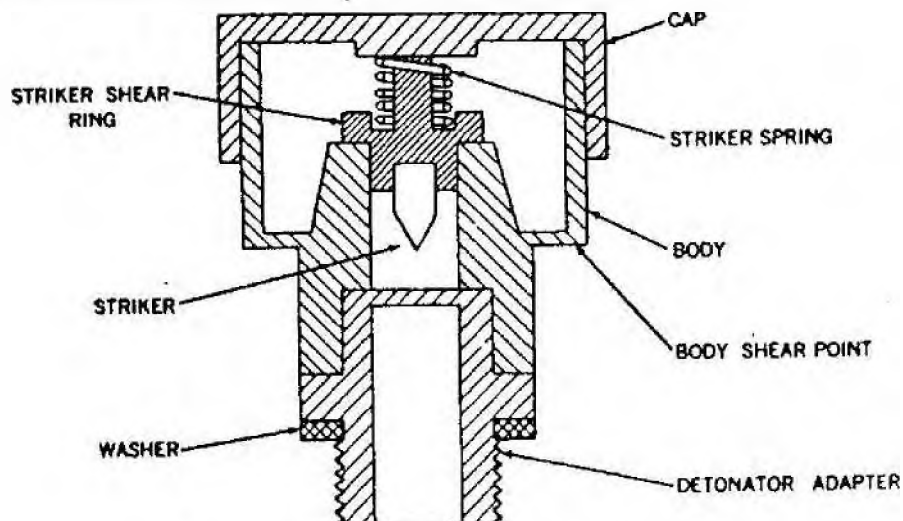


Figure 6-21. Fuze, Pressure, Model RO-7-11.

(4) Screw the fuze-detonator unit into the threaded well of the booster block.

(5) Install the assembly in the mine.

e. Disarming.

(1) Remove the booster and fuze assembly from the mine.

(2) Unscrew the fuze from the booster.

(3) Unscrew the detonator retaining collar from the fuze.

(4) Remove the detonator.

(5) Take the fuze to a safe storage or disposal area.

6-15. Fuze, Pressure-Mechanical, Model RO-8 (Czechoslovakia)

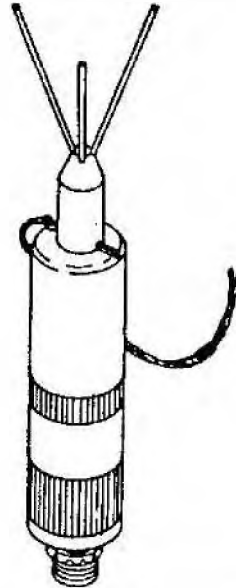


Figure 6-22. Fuze, Pressure-Mechanical, Model RO-8.

Dimensions	Case	Internal action	Operating force
Diameter: 0.7" Length: 4.1"	Steel	Pressure, mechanical, with ball release.	10 lb. approx

a. *General.* This fuze has a three-pronged plunger and a ball-retained striker. A safety pin

is inserted through the plunger at the top of the fuze case.

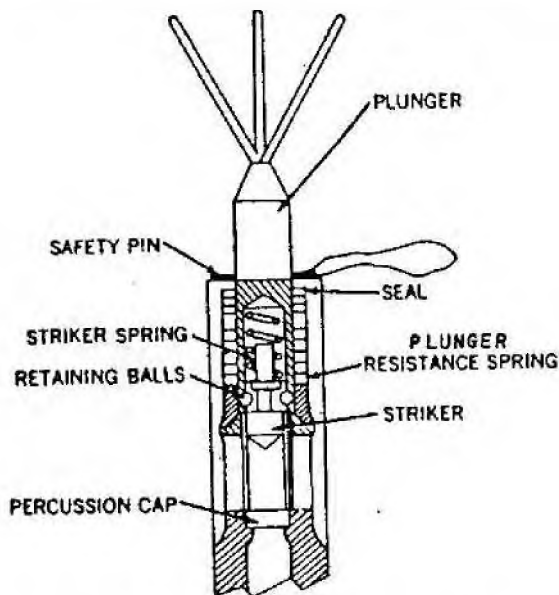


Figure 6-23. Fuze, Pressure-Mechanical, Model RO-8.

b. *Use.* This pressure fuze is used primarily in the PP-Mi-Sr bounding shrapnel mine.

c. *Functioning.* Pressure on the three prongs depresses the plunger and compresses the plunger spring, moving the firing mechanism and plunger downward, permitting the retaining balls to escape into the recesses in the side of the case. The striker spring, at the release of the retaining balls, drives the striker into the detonator, starting the firing chain.

d. *Installing and Arming.*

- (1) Screw the fuze into the mine.
- (2) Remove the safety pin.

e. *Disarming.*

- (1) Insert the safety pin into the hole in the plunger.
- (2) Unscrew the fuze from the mine.
- (3) Remove the fuze to a safe storage or disposal area.

6-16. Fuze, Tilt Rod (Czechoslovakia)

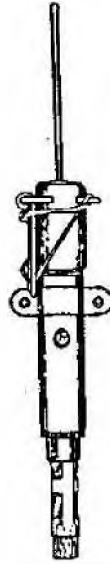


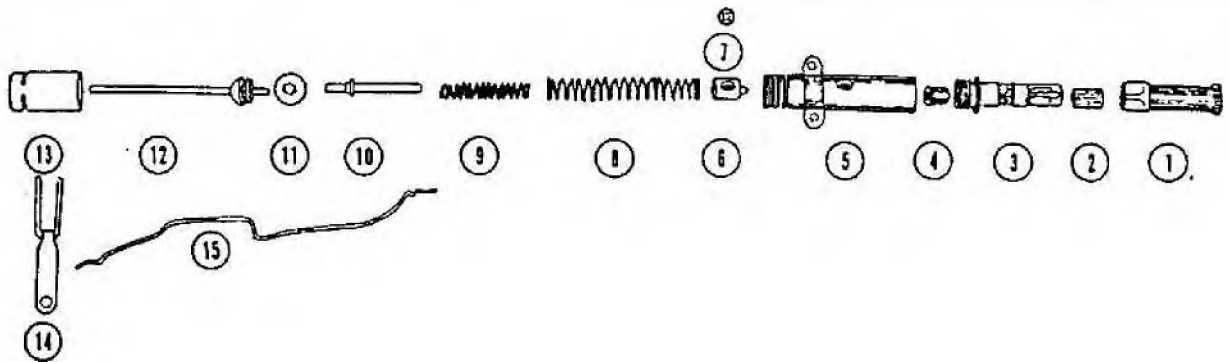
Figure 6-24. Fuze, Tilt Rod.

Dimensions	Case	Internal action	Operating force
Diameter: 0.47" Length: 5.69"	Brass	Mechanical	No data

a. *General.* This extremely sensitive mine fuze operates on the tiltrod principle. The body and body cap are brass; the other components are steel.

b. *Use.* The fuze is usually used in plate-charged mines.

c. *Functioning.* When a lateral pressure is applied sufficient to move the tiltrod approximately



1. Shipping Sleeve
2. Prong Protector Plug
3. Explosive Train Holder Assembly
4. Primer
5. Fuze Body
6. Firing Pin
7. Locking Ball
8. Firing Pin Spring
9. Locking Ball Retaining Pin Spring
10. Locking Ball Retaining Pin
11. Firing Pin Spring Retaining Washer
12. Tilt Rod Assembly
13. Fuze Body Cap
14. Safety Fork Assembly
15. Pull Tab Retaining Wire

Figure 6-25. Fuze, Tilt Rod.

15° off the center axis, the locking ball retaining pin is released, and is then moved upward by the pin spring. The locking ball moves into the recess created by the upward movement of the retaining pin, releasing the firing pin. The firing pin spring

then drives the pin downward, striking the primer.

d. Installing and Arming. The fuze is armed by removal of the pull tab retaining wire and the safety fork.

6-17. Fuze, Pull (Czechoslovakia)

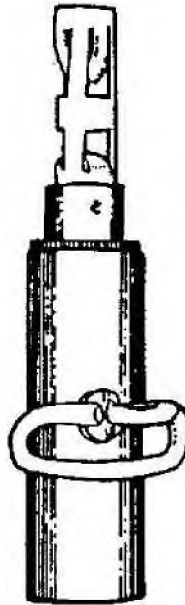


Figure 6-28. Fuze, Pull.

Dimensions	Case	Internal action	Operating force
Diameter: 0.5" Height: 2.63"	Bakelite	No data	No data

a. General. The fuze assembly of a black bakelite tubular-shaped body which contains a firing mechanism, pull pin, and a percussion primed base with a pronged fuze retainer. The body contains a bakelite firing pin and steel firing pin spring held locked by a wing-shaped pull pin located midway on the fuze body. The end of the body is threaded to accept the threaded end of the

primed brass base, which contains a press-fitted, battery cup type, center-fire percussion primer.

b. Functioning. The operation and component parts are comparable to the US weatherproof M2 fuze lighter. Due to the lack of a means of sealing the fuze card retainer, it cannot be considered weatherproof or waterproof.

6-18. Mine, Antitank, Nonmetallic Model PM 60 (East Germany)

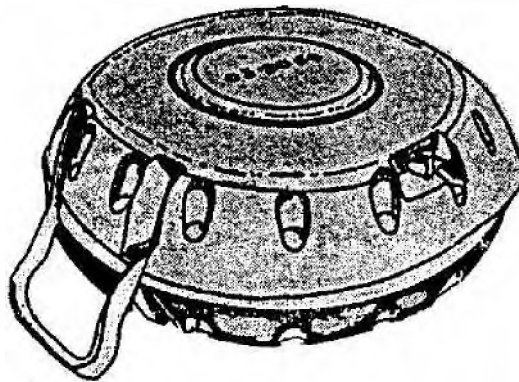


Figure 6-27. Mine, Antitank, Nonmetallic Model PM 60.

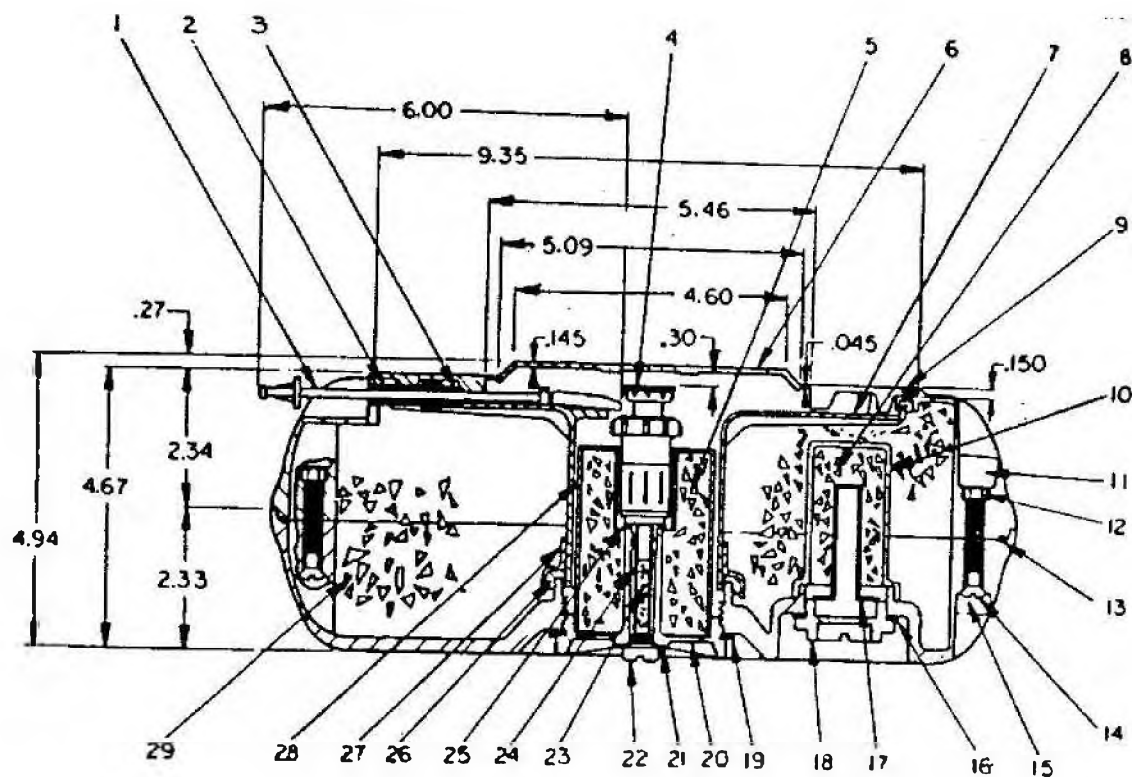
Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 6"	25 lb.	Pressure- Chemical or Mechanical	No data	TNT Cast 22 lb	Tetrol 1.1 lb

a. General. The mine has a two-piece cylindrical plastic body, with 2 fuze wells. It contains a pressure plate, filler shield, filler seal, spaces, booster assembly, secondary booster assembly, detonator and fuze. Fuze is threaded into the booster assembly. A detonator is installed, below the fuze, in the booster well cap and contained by a closing plug.

b. Use. Mine is positioned in the ground to ex-

plode when run over by tank or vehicle.

c. Functioning. Load applied to pressure plate is transmitted to fuze, driving the firing pin into the primer. Primer initiates detonator-booster-main charge firing chain. A blasting cap and firing device may be installed in the secondary booster (boobytrap well). This initiates the secondary booster and main charge.



- | | | |
|-------------------------------|---------------------|-------------------------|
| 1. Safety Rod | 11. Lute (16) | 21. Gasket |
| 2. Plastic Tube | 12. Nut (16) | 22. Closure Plug |
| 3. Rubber Boot | 13. "O" Ring | 23. Detonator Explosive |
| 4. Fuze | 14. Screw Bolt (16) | 24. Detonator |
| 5. Booster Pellet | 15. Lute (16) | 25. Gasket |
| 6. Pressure Plate | 16. Gasket | 26. Spacer |
| 7. Filler Shield | 17. Plastic Sleeve | 27. Filler Seal |
| 8. Booster Pellet (Secondary) | 18. Closure Plug | 28. Booster Housing |
| 9. Cap Screw (8) | 19. Gasket | 29. Explosive |
| 10. Booster Cup (Secondary) | 20. Booster Cap | |

Figure 6-27.—Continued.

6-19. Mine, Antipersonnel, K-2 (East Germany)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.9" Height: 8.8"	8.8 lb	Pressure	No data	6.6 lb Nitro penta.	Not applicable

General. The body is made of plastic. Shrapnel consists of steel balls. The height reached at detonation is 1.5 meters.

6-20. Fuze, Pressure (East Germany)

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	Bakelite	Mechanical	No data

a. *General.* This is a pressure type detonating device.

b. *Use.* This fuze is used with antitank mines.

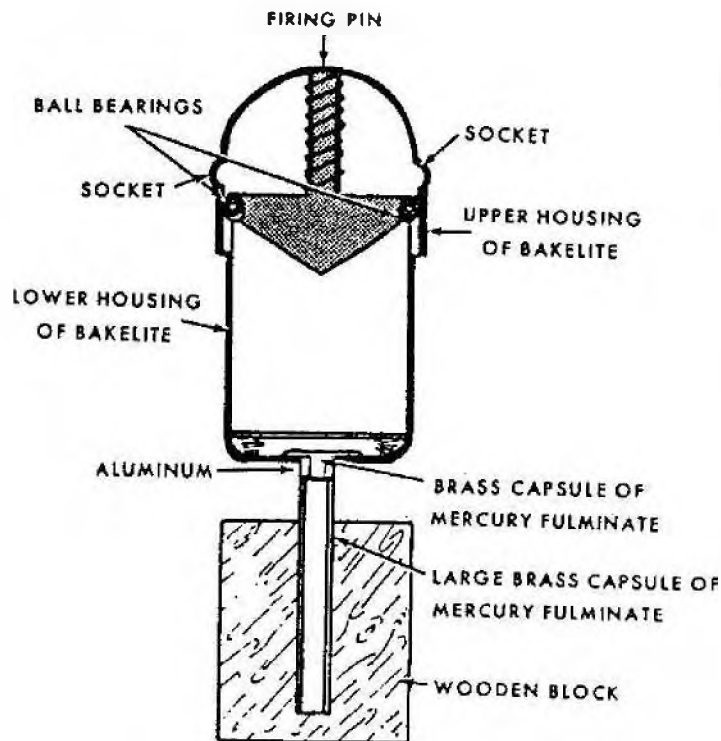


Figure 6-28. Fuze, Pressure.

6-21. Mine, Antitank, Nonmetallic (Modified SACI) (Egypt)

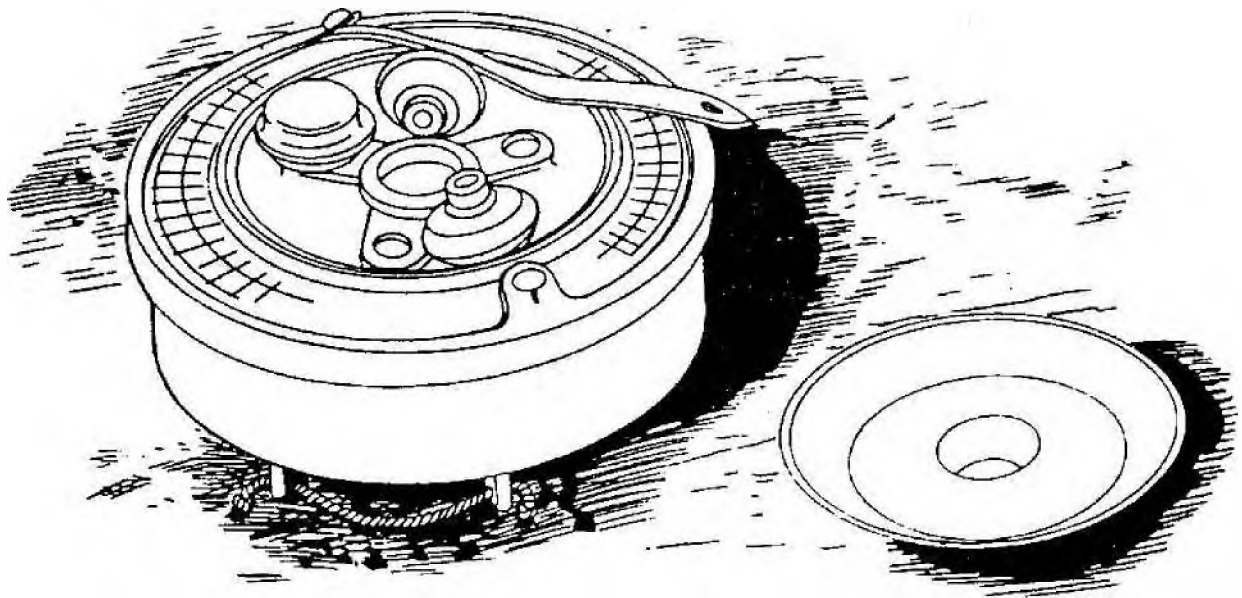


Figure 6-29. Mine, Antitank, Nonmetallic (Modified SACI).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11" Height: 8"	No data	Pressure	140 to 800 lb (approx)	15.5 lb TNT	2 RDX pellets

a. General. This is a copy of the Italian Model SACI mine. The pressure plate is 7.5" in diameter. The case is made of plastic. The mine is completely nonmetallic except for the fuze striker points and the detonators. The mine has three fuzes. The pressure plate has a 3-armed section positioned so that one arm rests above each fuze.

b. Functioning. Pressure on the top of the mine crushes the pressure plate, rupturing the shear mechanism and exploding the mine.

c. Installing and Arming.

(1) Remove the pressure plate from the mine.

(2) Place three fuzes and detonators into the three fuze wells.

(3) Replace the pressure plate.

d. Disarming.

(1) Search for and remove any antilift devices.

(2) Remove the pressure plates.

(3) Remove the three fuzes from the mine.

(4) Separate the detonators from the fuzes.

(5) Remove the mines, fuzes, and detonators to a safe storage or disposal area.

6-22. Fuze, Tilt-Rod, Antipersonnel Mine (Egypt)

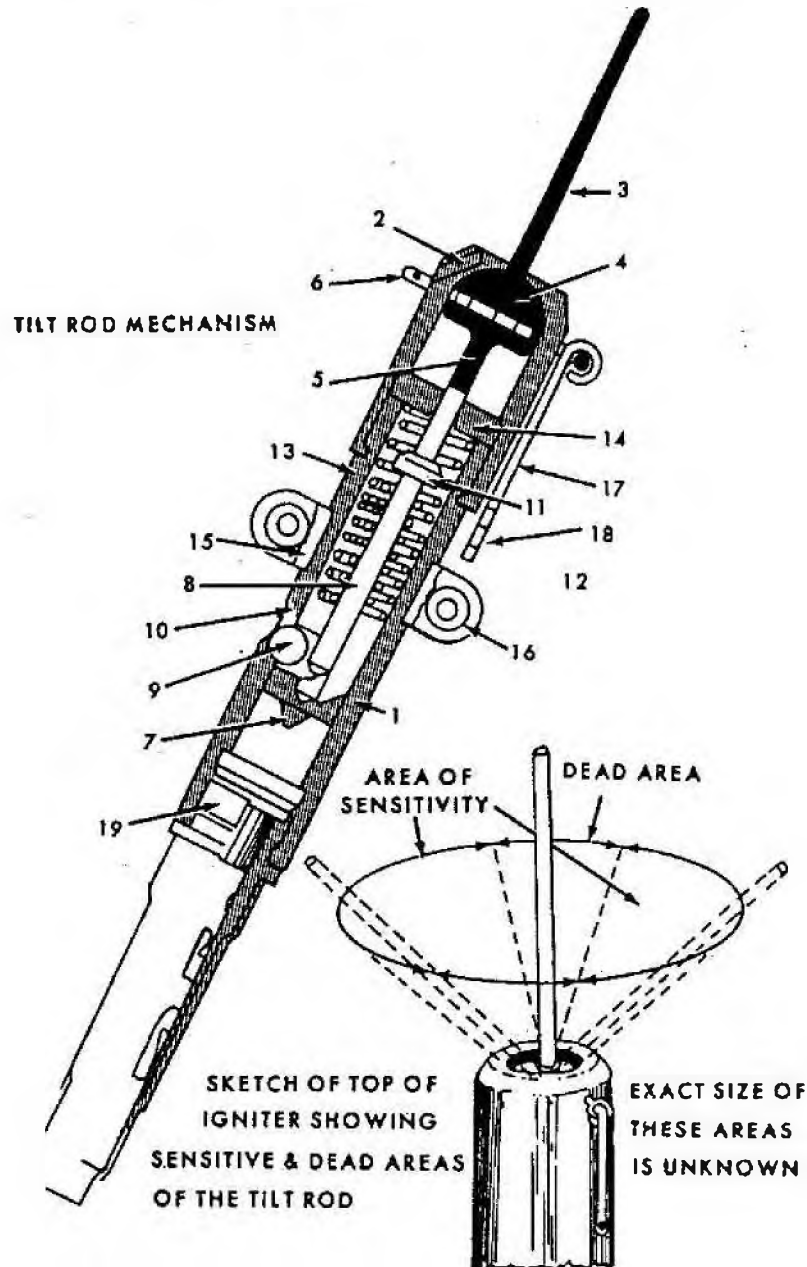


Figure 6-30. Fuze, Tilt-Rod, Antipersonnel Mine.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	No data	No data	1½ lb.

a. General. The casing of the fuze is of brass (1), the tiltrod (3), tiltrod ball (4), and tiltrod ball projection (5) are made in one piece.

b. Use. This fuze is employed with both antipersonnel and antitank mines, primarily as a deterrent against the use of mine detectors. It may also

be used with a tripwire and may possibly be found as a normal boobytrap mechanism, either as a pull or a pressure fuze.

c Functioning. The ball retaining rod (8) is held against the tiltrod ball projection by means of the inner spring (12) which acts on the ball

retaining rod shoulder (11). The striker retaining ball (9) which is held in a recess in the casing by means of the retaining rod, prevents the striker from flying forward under the pressure from the outer spring (2). If a lateral force of more than $1\frac{1}{2}$ lb is applied to the tiltrod, the tiltrod ball projection acts as a gear. When the tiltrod reaches an angle of 15° from the vertical, the ball retain-

ing rod is allowed to fly up, releasing the striker retaining ball, which is forced into the center of the hollow striker. The striker then flies forward and strikes the cap. There is a safety pin (6) which passes through the casing and center of the tiltrod ball.

d. Precaution. Item appears to be completely unsafe.

6-23. Fuze, Pressure Release (Egypt)

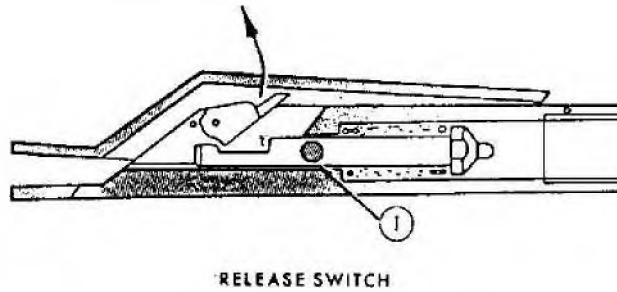


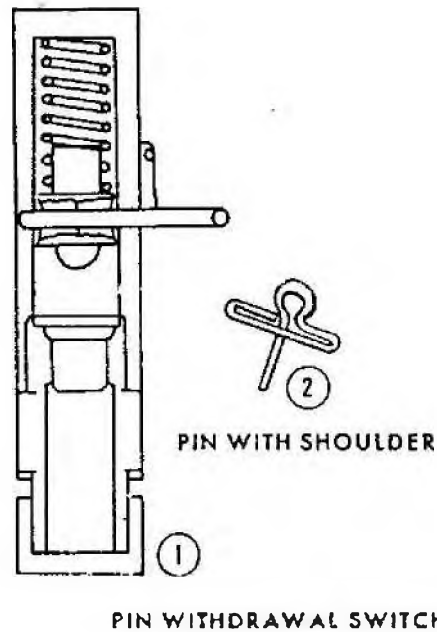
Figure 6-31. Fuze, Pressure Release.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	No data	No data	No data

a. *General.* The body is of metal with a pin as a safety device. This is a copy of the British No. 6, MK 1 pressure release switch.

b. *Use.* This is a boobytrap firing device and may also be used as a pin withdrawal mechanism by the attachment of a tripwire to the safety pin at (1).

6-24. Fuze, MUV (Type) Pull (Egypt)



PIN WITHDRAWAL SWITCH

Figure 6-52. Fuze MUV (type) Pull.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	No data	No data	No data

a. *General.* This fuze is based on Soviet MUV design. The short striker-closed end design is probably used to prevent entry of sand. The pin is provided with a shoulder (2) which is very similar to that of the MUV Igniter. It is believed the switch is used with a "schu type" mine.

b. *Use.* This is a boobytrap firing device (pin withdrawal type).

c. *Functioning.* Withdrawal of the pin by means of a tripwire causes the mechanism to operate.

6-25. Mine, Antitank, Shaped Charge, Nonmetallic (Hungary)

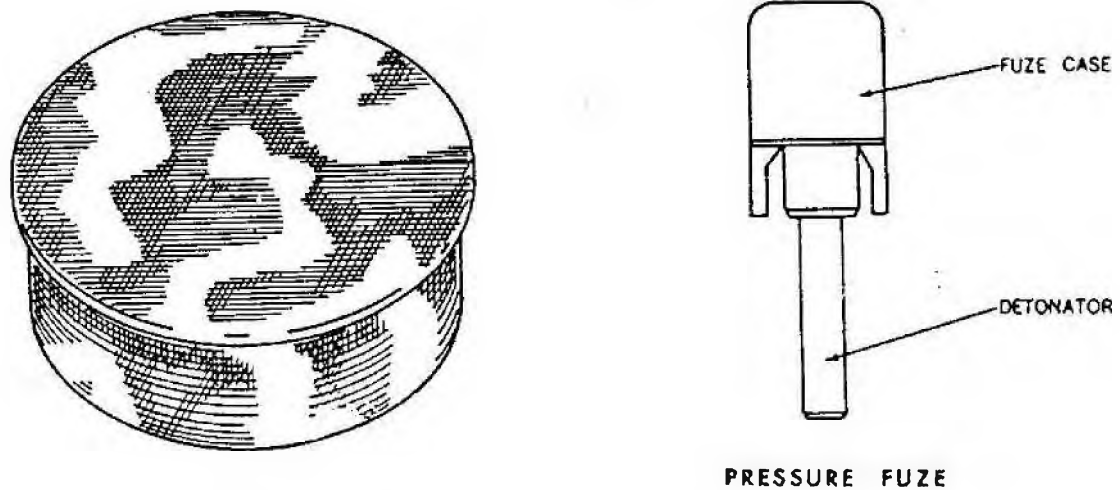


Figure 6-33. Mine, Antitank, Shaped Charge, Nonmetallic.

Dimensions	Wt.	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.7" Height: 9.3"	12 lbs approx	Pressure	1,000 lbs approx	TNT	PETN

a. *General.* The charge is placed in a cardboard case with a plywood top and bottom. The mechanism is adjustable to function at the application of varying amounts of pressure. Sometimes an

L-shaped metal angle iron is used as an accessory. When the tank runs over the upright leg of the L, the mine, attached to the other leg, is slammed up, detonating when it strikes the belly of the tank.

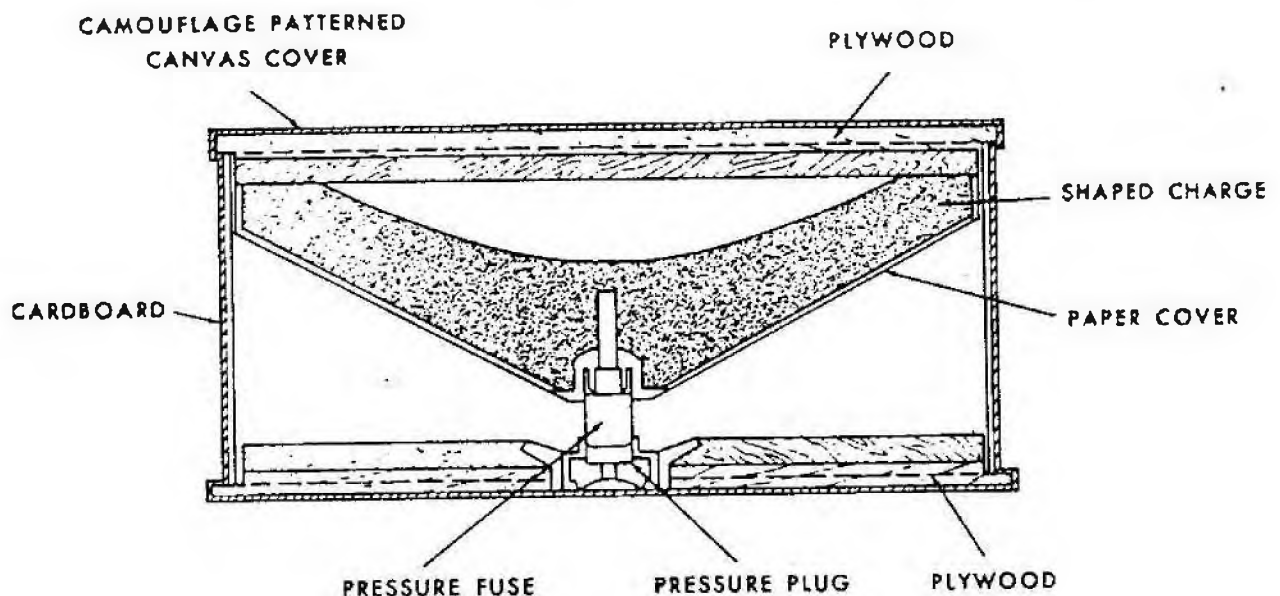


Figure 6-34. Mine, Antitank, Shaped Charge, Nonmetallic.

b. *Use.* This nonmetallic mine is used against heavy and medium combat vehicles. In snow, the fuze is adjustable to function under less than standard pressure by the omission of the pressure cap.

c. *Functioning.* Pressure on the top of the mine crushes the case and actuates the pressure fuze in the bottom. It may also function by impact by use of the L-shaped angle iron described above.

6-26. Mine, Antipersonnel, "Ramp Mine" (Hungary)

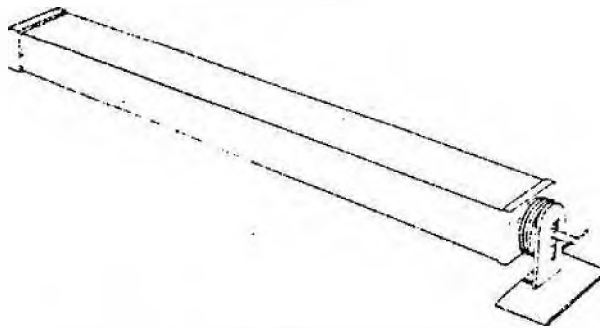


Figure 6-35. Mine, Antipersonnel, "Ramp Mine".

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 18.7' Width: 1.9' Height: 1.2'	9 lbs	Pull	Less than 10 lbs.	1.8 lb TNT	

a. General. This mine is essentially four blocks of explosive placed in an elongated sheet metal case. It has a mechanical fuze with a spring-loaded striker and a metal stand to hold it in armed position.

b. Use. These mines are frequently laid in small trenches about 1 meter apart, with about 1 meter between the individual mines. They are then covered with a 5-centimeter layer of ground.

c. Functioning. Force on the elevated or fuze end of the mine pushes the tongue out of the hole in the striker and releases it to hit the percussion cap.

d. Installing and Arming.

(1) Pull back on the cocking pin and insert a safety pin (with string) through the outer hole in the striker shaft.

(2) Screw a percussion cap and detonator assembly into the base of the fuze.

(3) Screw the fuze assembly into the fuze end of the mine.

(4) Place the mine in the prepared spot, lift the fuze end, and slide the slot of the arming stand over the striker shaft.

(5) Pull back on the cocking pin until the

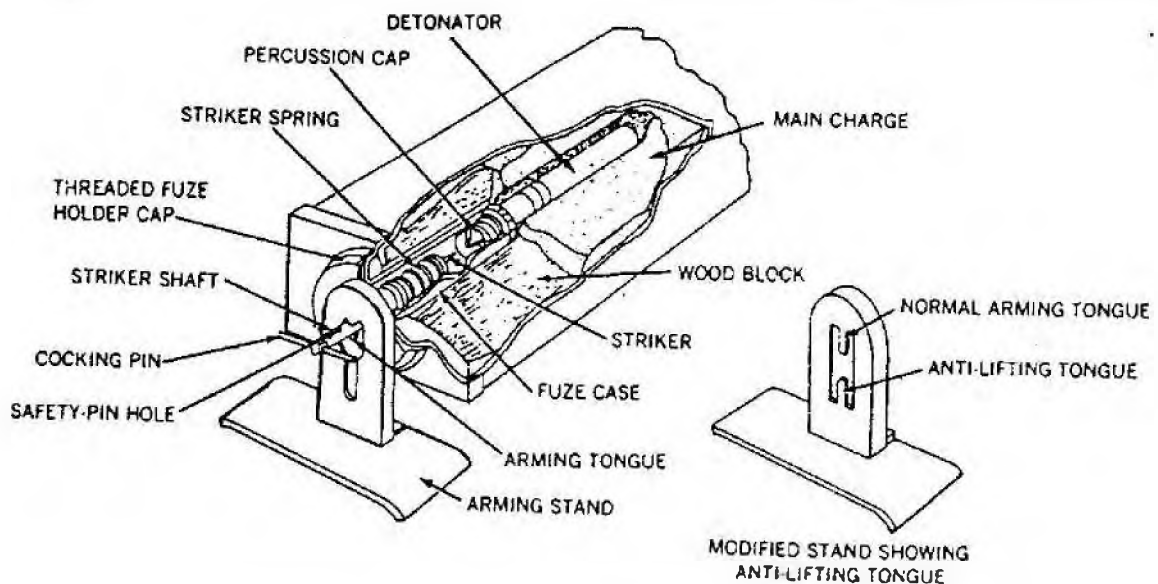


Figure 6-36. Mine, Antipersonnel, "Ramp Mine".

inner hole in the striker shaft is exposed and slide the arming tongue on the stand into this hole.

(6) Release the cocking handle until the tongue bears against the fuze-holder cap and cover the mine.

(7) Remove the safety pin by pulling on the string attached to it.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Insert a wire or nail into the safety-pin hole.

(3) Disengage the tongue of the stand from the striker shaft and let the latter slide in until it is held by the safety pin.

(4) Unscrew the fuze assembly from the mine.

(5) Unscrew the detonator assembly from the fuze.

(6) Remove the mine and fuze to a safe storage or disposal area.

f. Precautions.

(1) If the tongue has been inserted in the safety pin hole so that the inner hole is not visible, the striker shaft must be pulled out carefully until the inner hole is exposed and a safety pin is inserted. *Insert the safety pin before disengaging the tongue from the striker shaft.*

(2) *A modified arming stand has an anti-lifting tongue projecting up from the bottom of the slot in the stand.* In this case, the lower tongue is inserted in the inner hole in the striker shaft, so that the mine may function only when the fuze end is lifted. Disarming with the modified arming stand, however, is the same as for the original.

6-27. Mine, Antipersonnel Plastic M62 (Hungary)

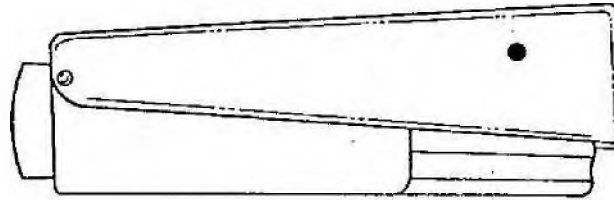


Figure 6-37. Mine, Antipersonnel Plastic M62.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Width: 1.8" Height: 2.1" Length: 7"	13.6 oz	MUV Pull	9 lbs.	TNT 2.6 oz	N/A

a. General. This mine resembles the PMD-7TS Soviet AP mine. The mine housing is made of

plastic. Metal parts are pivot pin; safety pin; fuze and striker pin (encased in plastic); striker pin

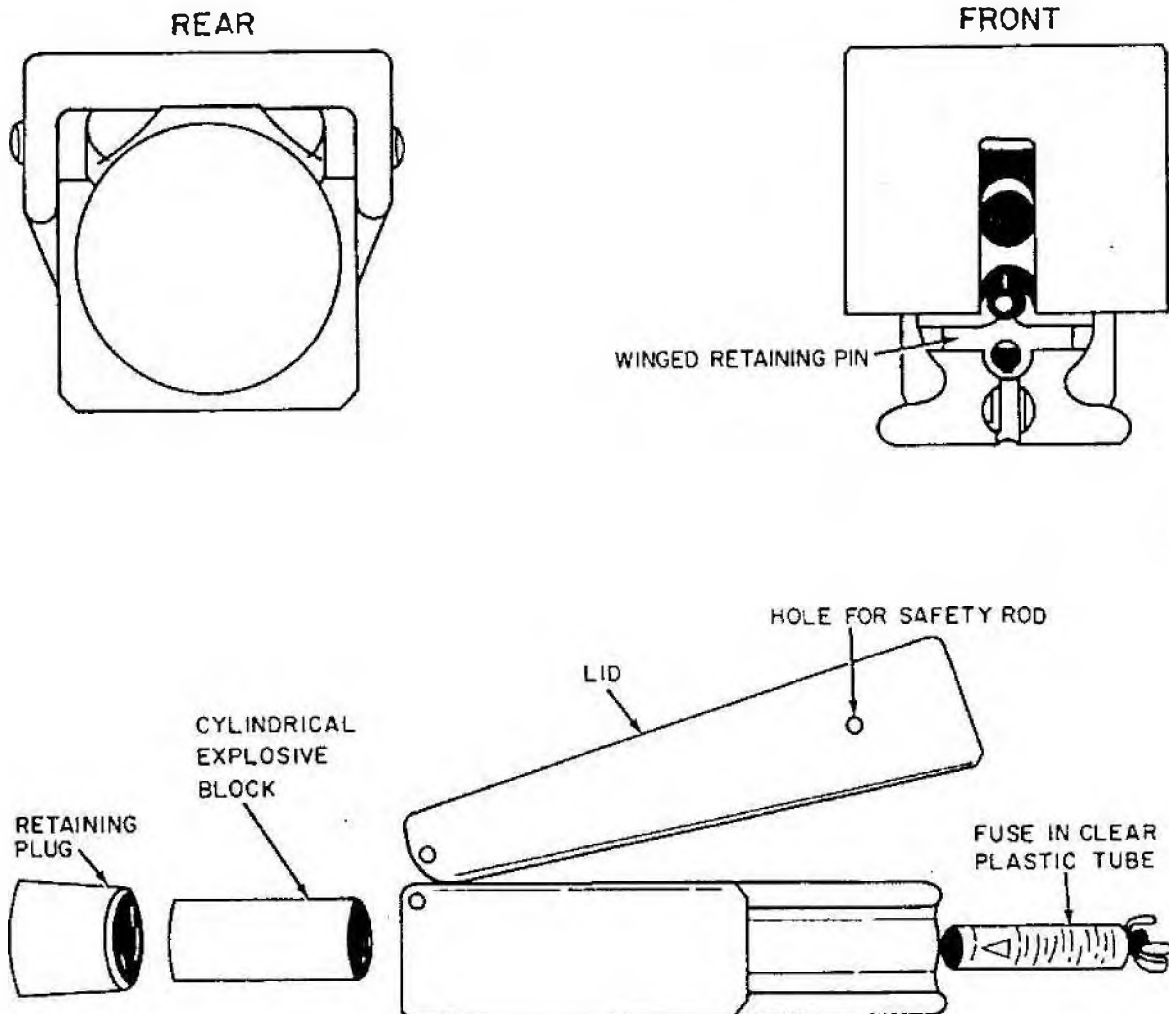


Figure 6-38. Mine, Antipersonnel Plastic M62.

spring, and detent. All metal parts are presumably anti-magnetic to thwart electronic mine detection.

b. Use. It is used primarily along the Hungarian border to prevent intrusion.

c. Functioning. When pressure is applied, the lid pivots about the hinged end and the free end of the lid pushes the winged pin down, out of the firing pin. When the winged pin is removed, the firing pin is driven forward, striking the primer and detonating the mine. Normally, it requires 2 lb of pressure to push the pin out of an MUV fuze. However this mine incorporates a shear pin

below the release pin which increases the force needed to approximately 9 pounds.

d. Installing and Arming.

(1) Insert the fuze in the fuze well in the front of the mine.

(2) Place the charge in the capped charge well in the rear of the mine.

e. Disarming.

(1) Insert a straight pin in the safety hole of the striker pin.

(2) Place a safety pin through the upper portion of the housing to prevent the downward movement of the cover.

6-28. Mine, Antipersonnel, Bounding (Hungary)

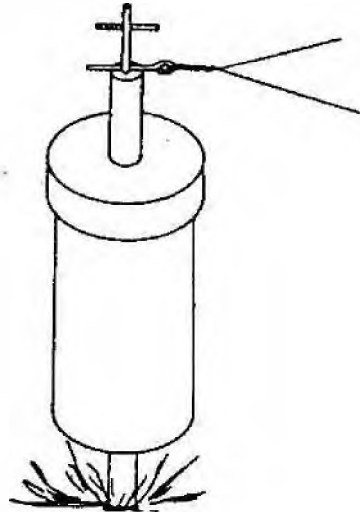


Figure 6-29. Mine, Antipersonnel, Bounding.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.6" Height: 11.7"	8 lb approx	Pull	10 to 20 lbs	1.7 lb TRI-II	Black powder

a. *General.* This cylindrical, metal-cased bounding mine is hurled into the air, where it explodes and scatters a steel-ball shrapnel charge in all directions. The bottom of the case is recessed to accommodate a wooden mounting stake. This mine has a black powder propellant charge.

b. *Use.* Bounding mines are laid in pattern in minefields. Such mines are laid in rows about 10 meters apart at a space of about 20 meters between individual mines. Those in one row are staggered between those in adjacent rows.

c. *Functioning.* A pull on the tripwire removes

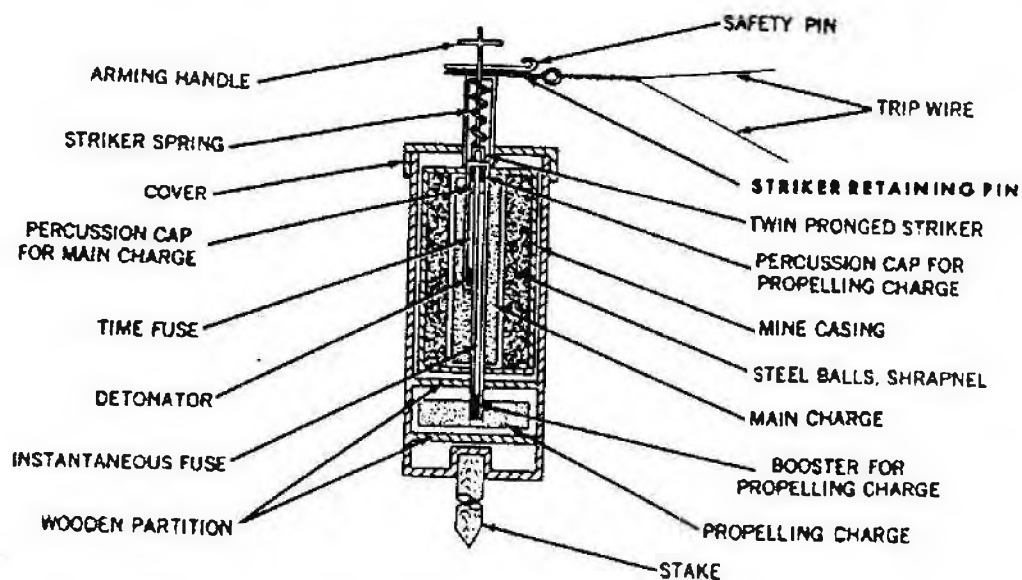


Figure 6-40. Mine, Antipersonnel, Bounding.

the striker retaining pin and releases the double-pointed striker. It then simultaneously hits two percussion caps igniting a short piece of time fuse and a longer piece of instantaneous fuse. The latter burns through first, setting off the black powder propellant. This projects the mine about .5 meter above the ground, where the main charge explodes, scattering the steel balls in every direction.

d. Installing and Arming.

(1) Drive the mine stake into the ground and fasten the container on the top.

(2) Insert the mine into the container.

(3) Pull out the cocking handle of the fuze to expose the two holes in the striker shaft.

(4) Insert the striker retaining pin in the innermost hole.

(5) Insert the safety pin in the outer hole.

(6) Insert the fuze in the mine.

(7) Drive a stake 10 meters to each side of the mine and anchor one end of a tripwire to each stake.

(8) Tie the loose ends of the tripwires to the pull pin of the fuze.

(9) Remove the safety pin.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Insert a nail or wire in the safety-pin hole.

(3) Trace and cut the tripwire close to the fuze.

(4) Remove the fuze.

(5) Remove the mine and fuze to a safe storage or disposal area.

6-29. Fuze, Pull (Hungary)

Figure furnished for identification purposes.

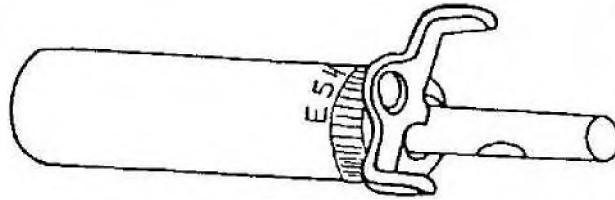


Figure 6-41. Fuze, Pull.

6-30. Mine, Antipersonnel, (Adaptation of Soviet POMZ-2 MAP AP Mine) (North Korea)



Figure 6-42. Mine, Antipersonnel, (Adaptation of Soviet POMZ-2 MAP AP Mine).

Dimensions	Wt	Fuz	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.87" Length: 4.12"	41.8 oz (case)	Copy of Soviet Pressure Release MUV Pull or UPF	2.2 lb. or more	TNT 2.64 oz	N/A

a. General. The cast iron mine body has 5 circumferential rows of serrations bisected by 10 rows of longitudinal serrations. The explosive filler cavity permits insertion of a standard pre-formed cylindrical TNT charge. The cavity is

closed with a round wooden picket which also supports the mine in position when emplaced.

b. Use. The mine is used against foot troops and can inflict limited damage to light steel vehicles.

6-31. Mines, Antitank, 100mm, 150mm, and 200mm (Diameters) (North Vietnam)

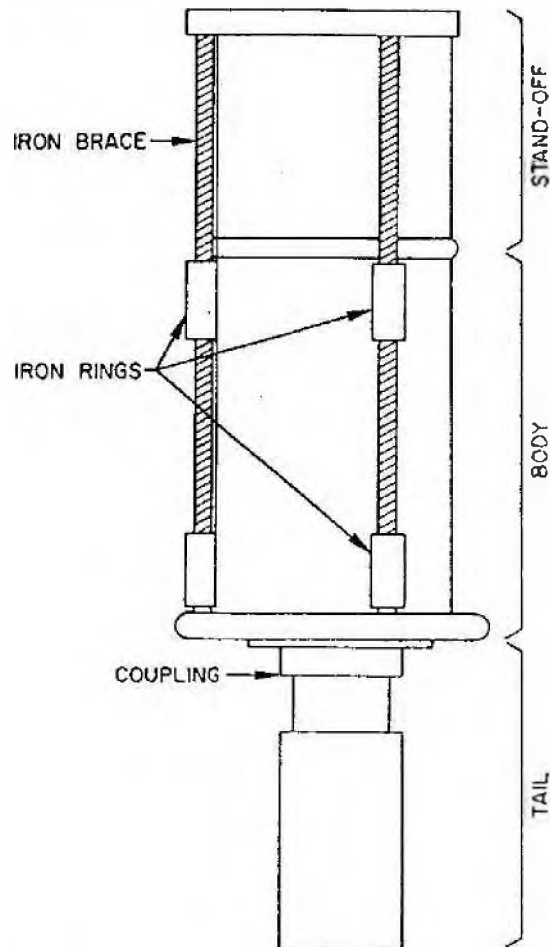


Figure 6-43. Mines, Antitank, 100mm, 150mm, and 200mm (diameters).

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter:			See below		
Height:					

a. General.

	100mm	150mm	200mm
Overall length:	12.2"	14.4"	17"
Weight:	6 lb	13.6 lb	24.25 lb
Length of standoff:	4.4"	5"	6"
Main charge (TNT):	3.5 lb	8.8 lb	16.5 lb

A compressed (density over 1.55) TNT booster charge functions as a pressure firing agent in the mines. Mercury fulminate fuzes and K-50 detonators are used.

b. Use. Mines are used in conventional manner against tanks.

c. Functioning. The mine is set below the ground and when a tank or vehicle passes over the mine, the weight of the tank or vehicle pushes down the standoff and enables the body to break the iron bolt restraining the firing pin. The spring then pushes the firing pin against the detonator which detonates the mine.

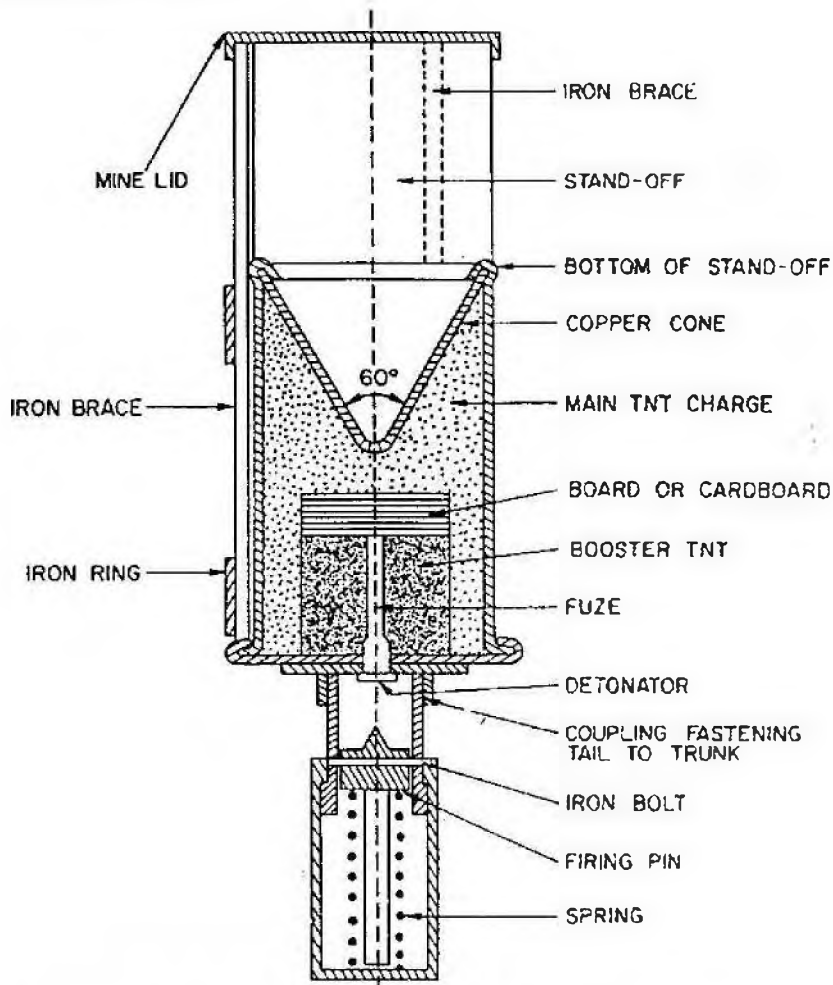


Figure 6-44. Mines, Antitank, 100mm, 150mm, and 200mm (diameters).

6-32. Mine, Dual Purpose, DH-10 Directional, Fragmentation, (VC Claymore) (North Vietnam)

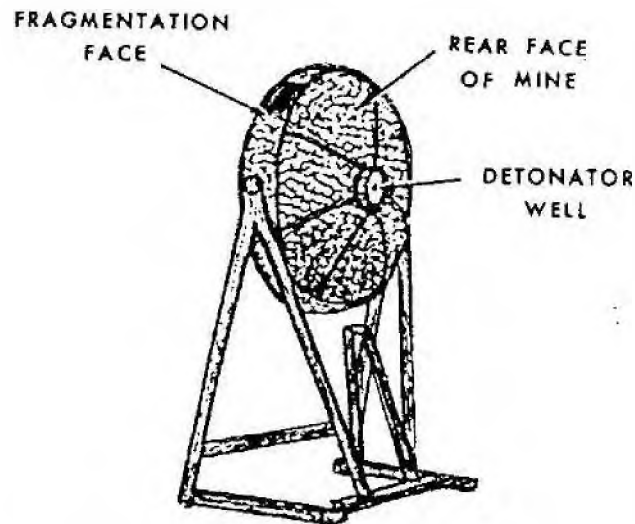


Figure 6-45. Mine, Dual Purpose, DH-10 Directional, Fragmentation, (VC Claymore).

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: 18" Width: 4"	20 lb	electric	NA	Cast TNT	

a. *General.* This directional mine is primarily an antipersonnel mine which also can be used against thin skinned vehicles. The concave front or fragmentation face of the mine contains approximately 450 half-inch steel fragments embedded in a matrix backed up by cast TNT.

b. *Use.* Mine is used against personnel or thin-skinned vehicles.

c. *Functioning.* The mine is designed for electrical detonation and is provided with an adjustable frame so that it can be placed on various types of surfaces and aimed in any direction. The single

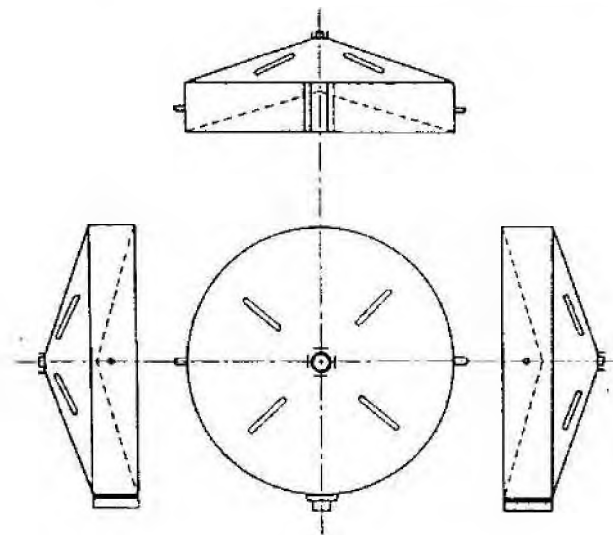


Figure 6-46. Mine, Dual Purpose, DH-10 Directional, Fragmentation, (VC Claymore).

fuze is well centered on the convex (back) of the mine.

d. Installing and Arming.

(1) Place mine on the 4-legged support with its concave side facing the target.

(2) Look through the aiming sight to point the mine toward the target.

(3) Insert electric blasting cap into the rear hole.

(4) Unroll the wire and detonate.

6-33. Mine, B-40 Round Antivehicular Mine (North Vietnam)

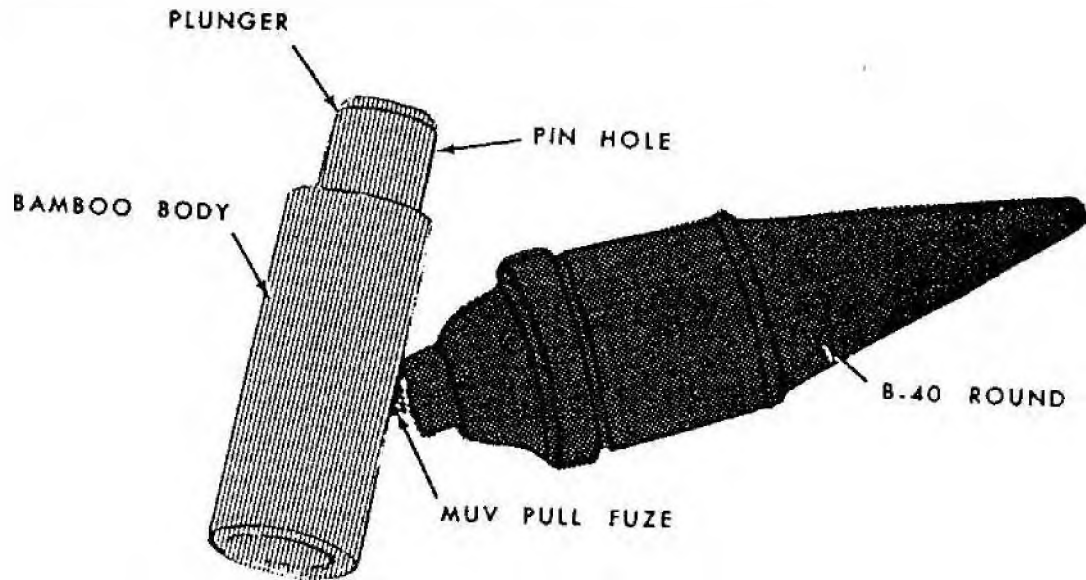


Figure 6-47. Mine, B-40 Round Antivehicular Mine.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: See below: Height:	2.7 lb.	Soviet MUV	1¼ lb minimum 2¾ lb average 4¼ lb maximum	RDX-TNT 1.2 lb	

	Length	Diameter	a. General. This antivehicular mine consists of a B-40 round minus the fin section, a bamboo body and plunger, and a Soviet MUV pull fuze. The fuze is placed in the slit of the bamboo body
B-40 Round	10"		
Bamboo body	4.6"	1.9"	
Bamboo plunger	3.5"	1.5"	

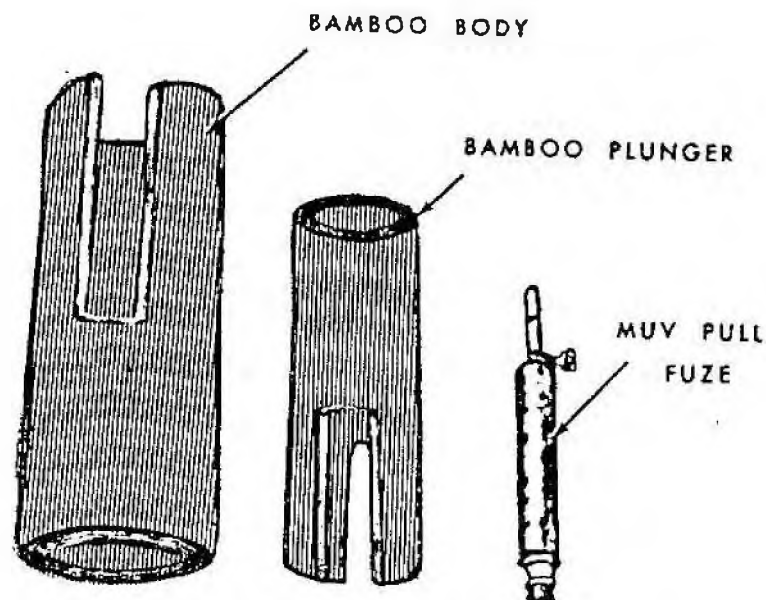


Figure 6-48. Mine, B-40 Round Antivehicular Mine.

and the detonator end is inserted into the well of the B-40 round. The plunger rests on the winged restraining pin of the fuze. The mine is wrapped in plastic with a bamboo mine marker tied with an overhand knot beside it.

b. *Functioning.* Pressure on the plunger pushes out the retaining pin which allows the striker to move forward detonating the mine. A pin may be placed through the top of the plunger to serve as a safety device or to give resistance to the functioning of the fuze.

6-34. Mine, Antivehicular, MCX 7A "Min (Chong) Chien Xu" (North Vietnam)

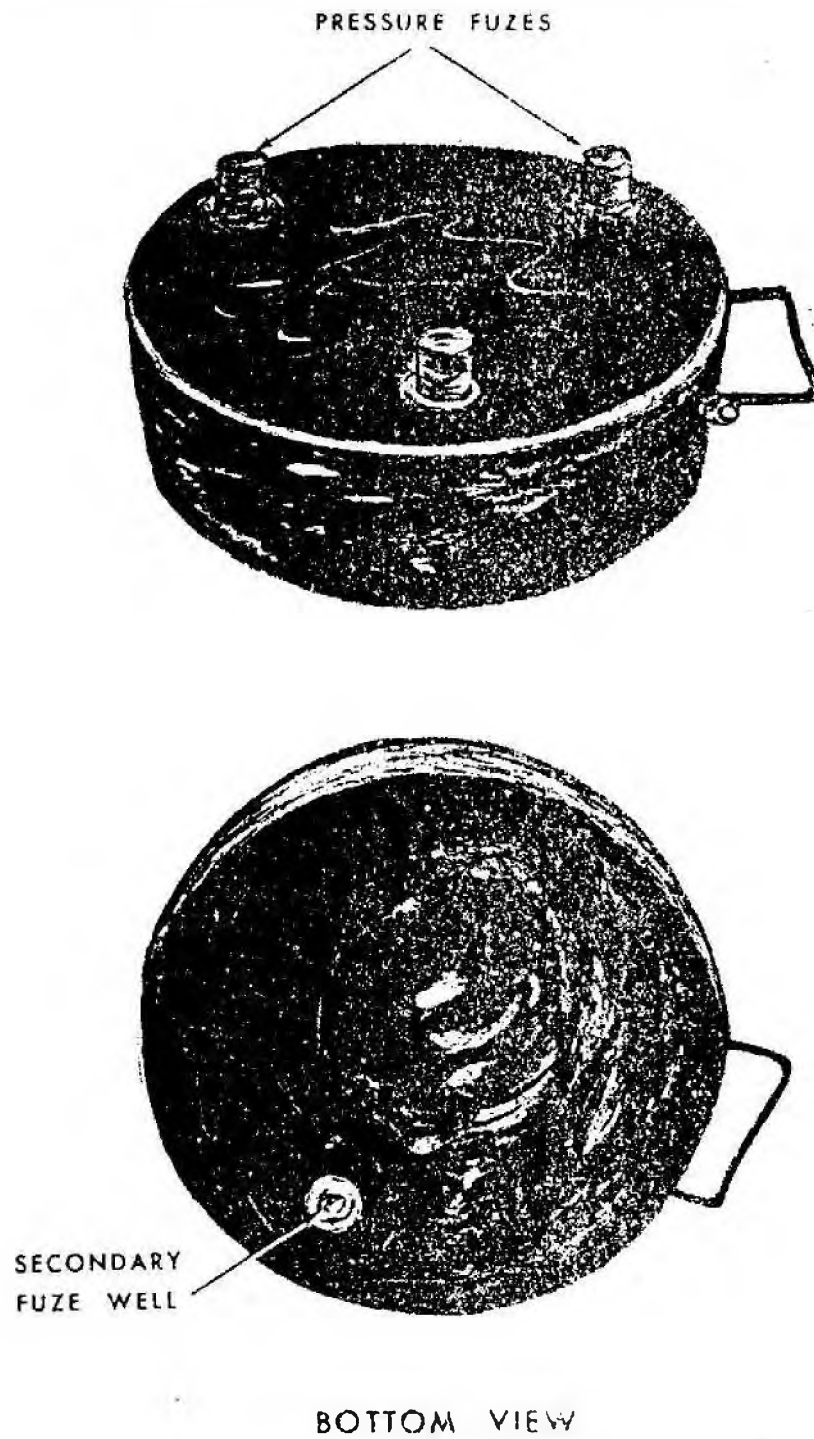


Figure 6-49. Mine, Antivehicular, MCX 7A "Min (Chong) Chien Xu".

Dimensions	Wt	Fuze	Explosive	Explosive	
				Main charge	Booster
Diameter: 10 9" Height: 3 3"	19.6 lb	Three CNTA Pressure		17.4 lb Cast TNT	

a. General. This mine consists of a cylindrical body of thin sheet metal, cast TNT explosive filler, three tetryl booster charges, three CS 7A pressure fuzes, three fuze well pressure covers, a secondary fuze well, and a carrying handle. The top plate has three blasting cap wells that fit into the tetryl booster charges. The CX 7A pressure fuzes fit into the blasting cap wells and the pres-

sure covers screw down over the fuzes to provide added resistance to the functioning of the fuzes. The secondary fuze well on the bottom of the mine is for booby trapping and anti-lift purposes. The CX 7A pressure fuze consists of an aluminum base, blasting cap, percussion cap, and an aluminum cap with a striker pin.

b. Use. Damage to wheeled or tracked vehicles.

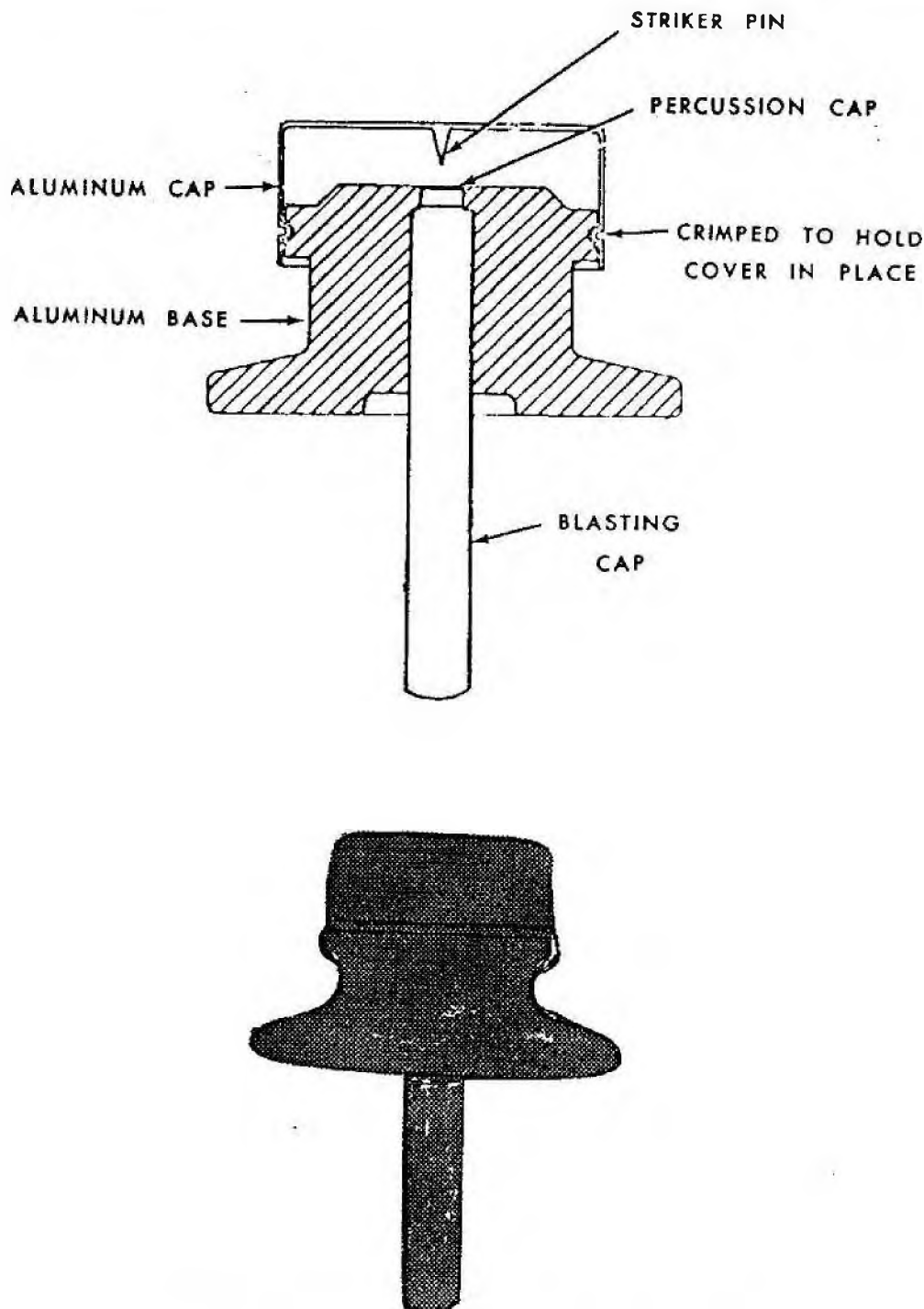


Figure 6-50. Mine, Antivehicular, MCX 7A "Min (Chong) Chien Xa".

c. Functioning. Pressure on the aluminum cap forces the striker pin into the percussion cap detonating the blasting cap. Three fuzes are employed

with this mine to insure detonation; a wheel or track passing over any portion of the mine will cause one of the fuzes to function.

6-35. Mine, Water and Fragmentation (North Vietnam)

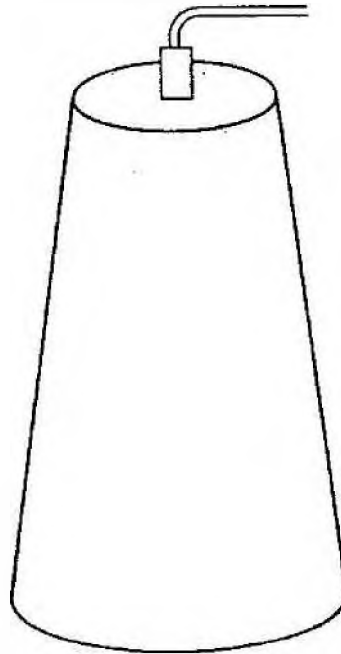


Figure 6-51. Mine, Water and Fragmentation.

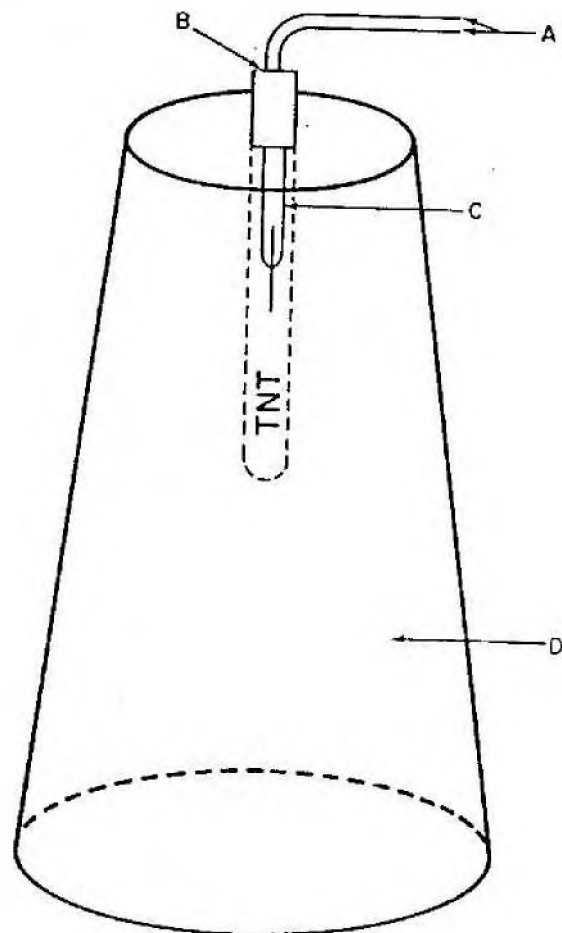
Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	88-155 lb	Electric	N/A	Potassium Chlorate	N/A

a. *General.* Mine has fuze of TNT and detonator. Water mines are command detonated.

b. *Use.* Before detonation, a soldier is stationed on one side of a river, with the mine on the other

side, with a set wire leading to the soldier. When a boat approaches, the soldier pulls the mine into the path of the boat and detonates the mine.

c. *Precaution.* Mine contains no safety devices.



LEGEND:

- A. WIRES FOR DETONATION OF MINE.
- B. DETONATOR.
- C. FUSE OF TNT.
- D. POTASSIUM CHLORATE

Figure 6-52. Mine, Water and Fragmentation.

**6-36. Mine, Antipersonnel, Miniature, Directional, Fragmentation
DH-5 (Circular or Saucer Shaped (North Vietnam))**

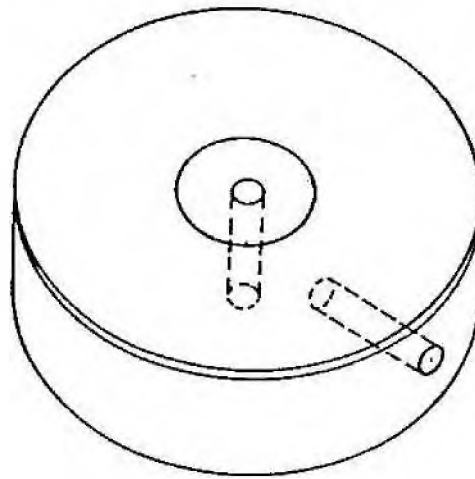


Figure 6-53. Mine, Antipersonnel, Miniature, Directional, Fragmentation DH-5 (Circular or Saucer Shaped).

Dimensions	Wt	Fuz	Operating force	Explosive	
				Main charge	Booster
Diameter: $4\frac{1}{2}$ " Thickness $1\frac{1}{8}$ "	No data	Blasting cap	N/A	Cast tritonal or or H-6	Chinese Communist plastic explosive

General. This mine is a circular or saucer shaped directional fragmentation munition made of sheet metal, painted dark green. A painted white arrow points in the direction the munition is intended to be fired. The booster cavity is filled with plastic explosive and contains two cap wells. One well is formed by a mandrel passing through the center of the munition in the same manner as the MDH-10 mine. Another cap well is formed by a mandrel passing laterally through the side of the munition. The lateral cap well is off-set toward the back surface of the munition to ensure a maximum explosive payload between the blasting cap and the fragments. The front concave surface

of the munition contains the fragmentation while the back convex surface contains the explosive. The sheet metal casing surfaces are crimped together. The fragments are preformed metal sections of generally uniform size in a paraffin matrix. These fragments are placed in the munition in two layers, forming a random pattern. Each layer lays flat for a maximum fragmentation payload, occupying a minimum of space. A paper disc, cut to the diameter of the munition separates the fragments and the explosive. Fragments are forged iron bar sections $5/16$ " long, $5/16$ " wide, and $1/8$ " thick.

6-37. Mine Antipersonnel, Miniature, Directional, Fragmentation
DH-3 (Rectangular) (North Vietnam)

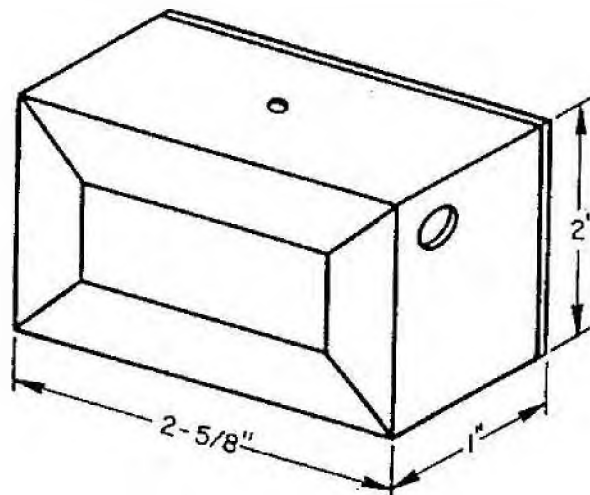


Figure 6-51. Mine, Antipersonnel, Miniature, Directional, Fragmentation DH-3 (Rectangular).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 2-5/8" Width: 2" Thickness: 1"	No data	Blasting Cap	N/A	Cast tritonal or H-6	Chinese Communist TNT

General. This munition is a rectangular shaped directional fragmentation munition made of sheet metal, painted flat white to grey. A painted black arrow points in the direction the munition is intended to be fired. The explosive filler, cast tritonal or H-6, is cast around the booster charge. The booster charge is made from a section of Chinese Communist 7 oz TNT block. This booster charge is placed diagonally across the munition. A single cap well has been drilled into the TNT

block. The front concave surface of the munition contains the fragments, while the flat back surface contains the explosive. The sheet metal casing is crimped together. These fragments are placed in the munition, in two layers, embedded in a paraffin matrix. The convex surface of the metal plate is next to the explosive filler forming a fragmentation cavity. Fragments are sections of metal nails 5/16" long by 1/8" in diameter.

6-38. Mine, Antipersonnel, Miniature, Directional, Fragmentation, DH-3 (Circular or Saucer Shaped) (North Vietnam)

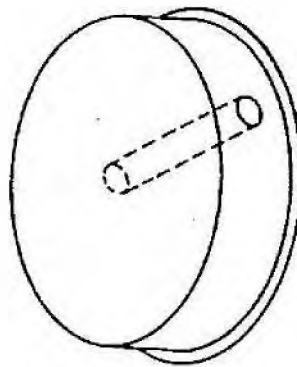


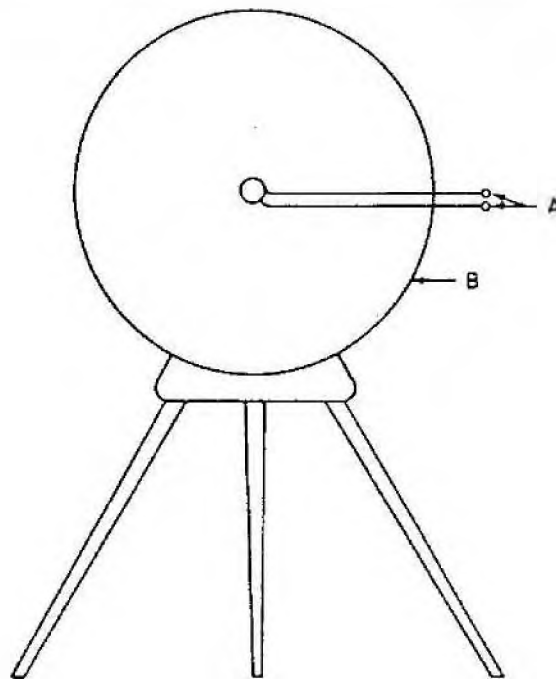
Figure 6-55. Mine, Antipersonnel, Miniature, Directional, Fragmentation, DH-3 (Circular or Saucer Shaped).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2 1/2" Thickness 15/16"	No data	Blasting Cap	N/A	Cast tritonal or H-6	Chinese Communist plastic explosive

General. This munition is a circular or saucer shaped, directional fragmentation munition made of sheet metal, painted light grey. A painted dark green arrow points in the direction the munition is intended to be fired. The booster charge is Chinese Communist plastic explosive with the cap well formed by a mandrel. The cap well is offset from the side of the body laterally to the back surface of the munition. This permits a maximum explosive payload between the blasting cap and

the fragments. The front concave surface of the munition, contains the fragments, while the back convex surface, contains the explosive. The sheet metal casing is crimped together. The fragments are sections of large nails, embedded in a paraffin matrix. These fragments are placed in the munition in two layers, forming a flat random pattern. A paper disc, cut to the diameter of the munition, separates the explosive from the fragments. The fragments are 5/16" long by 1/8" in diameter.

6-39. Mine, Antipersonnel, Fragmentation, DH-10 (North Vietnam)



LEGEND:

- A. WIRES FOR DETONATION
- B. MINE CASING

Figure 6-58. Mine, Antipersonnel, Fragmentation, DH-10.

Dimensions	Wt	Fuz	Operating force	Explosive	
				Main charge	Booster
Diameter:			See paragraph 6-32.		
Height:					



6-40. Mine, Antipersonnel, Pipe or Shell Casing (North Vietnam)

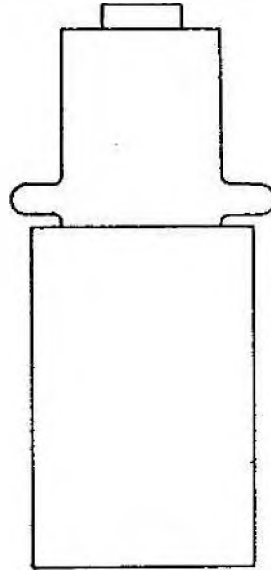
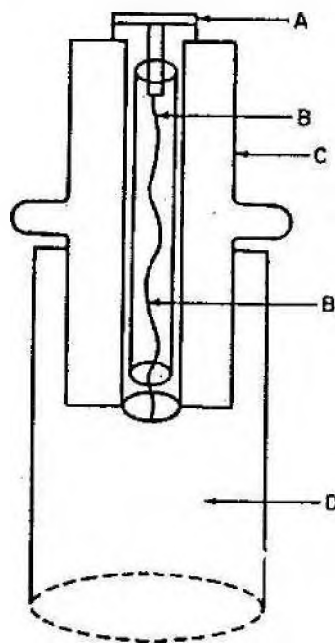


Figure 6-57. Mine, Antipersonnel Pipe or Shell Casing.

Dimensions	Wt.	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	No data	No data	No data	Fulminate explosive	N/A

General. The mine has fuze tube with slow burning fuze and detonator of pressure type.



LEGEND

- A. DETONATOR (pressure type).
- B. FUSE TUBE WITH SLOW BURNING WIRE FUSE.
- C. MINE CASING.
- D. FULMINATE EXPLOSIVE.

6-58. *Mine, Antipersonnel, Pipe or Shell Casing.*

6-41. Mine, Antipersonnel, MDH-7 Directional (Claymore Type) (North Vietnam)

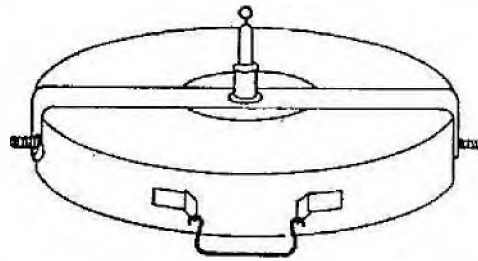


Figure 6-59. Mine, Antipersonnel, MDH-7 Directional (Claymore Type).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 7.9" Height: 2"	8.4 lb	Electric and non-electric	N/A	3.5 lb TNT	No data

a. General. The mine case is made of sheet metal. The mine may have a detonator well that runs through the entire body, which makes fuzing

from both sides possible, or a well that extends half way through. The mine is equipped with a 34" wide half-circle band $9\frac{1}{2}$ " in diameter that

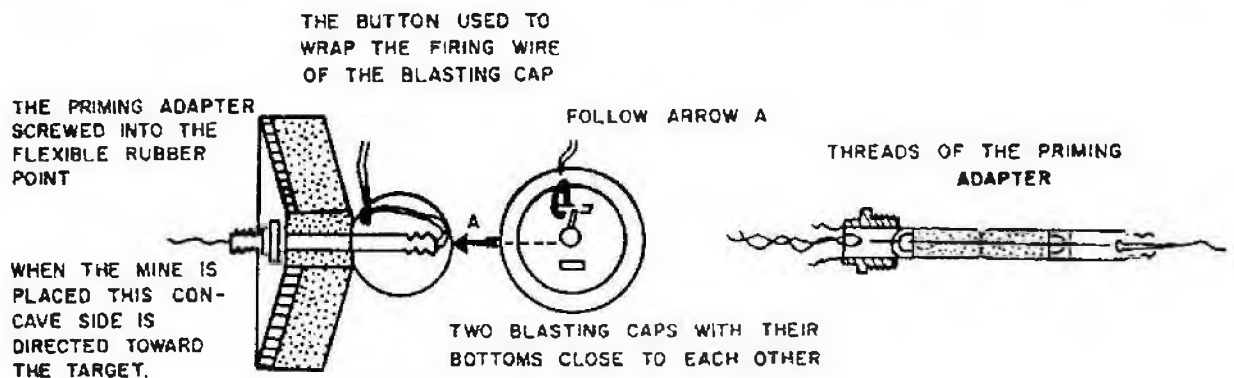


FIGURE 1: DIRECTIONAL MINE WITH THE DETONATOR RUNNING THROUGH ITS BODY.

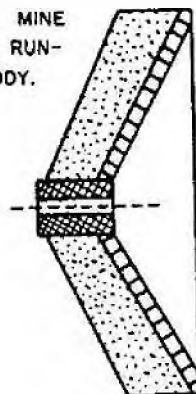


FIGURE 2: DIRECTIONAL MINE WHOSE DETONATOR DOES NOT RUN THROUGH THE BODY OF THE MINE AND IS INSERTED IN THE DIRECTION OF THE CONVEX SIDE

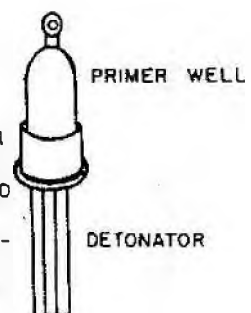
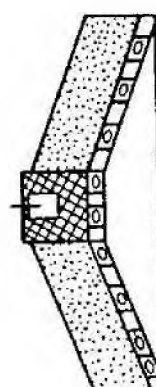


Figure 6-60. Mine, Antipersonnel, MDH-7, Directional (Claymore Type).

has wing nuts on both sides of the mine. To the center rear of this metal band, a 6" iron stake ($\frac{5}{16}$ " diameter) is attached by a bolt and wing nut. The effective range of the mine is 70 meters. Fragments are scattered 25 meters to the rear and sides of the mine.

b. Use. The mine is used against foot troops and to disable vehicles whose steel is less than 0.06".

c. Installing and Arming.

Emplacement

(1) Drive the iron stake into the ground or into a tree trunk, not less than 30 meters from friendly troops.

(2) Affix the handle to the mine and turn the two wing nuts on either side of the mine.

(3) Hang the mine *with the concave side toward the enemy* on the stake and loosen the upper wing nut.

(4) Use the detonator well to aim the mine at the target by sighting through it.

(5) Fix the direction of the mine by adjusting the upper wing nut and fix the range of the mine by adjusting the wing nuts on either side of the mine.

(6) Remove cover on detonator well and pierce paper on other end of well on the convex side of the mine.

Electric Firing

(7) Insert the firing wire of the blasting caps through the detonator well from the concave side of the mine.

(8) Place the blasting caps into the detonator well with their bottoms close together and screw the primary adapter to the flexible rubber joint.

NOTE

When screwing the priming adapter, which connects one blasting cap into the detonator well, it must be screwed slowly to help turn the other blasting cap which has no priming adapter.

(9) Straighten the firing case of the blasting caps and wrap the wire around the button on the convex side of the mine to prevent the blasting caps from slipping out of the mine.

(10) Connect the blasting cap wires to the source of electricity.

Nonelectric Firing

(11) Insert 2 detonators or detonator from concave side (if well does not extend through body of mine).

(12) Tightly fasten the primer well to the mine with wire or string.

(13) Detonate by nonelectrical means.

6-42. Mine, Antipersonnel, "Flying Mine" (North Vietnam)

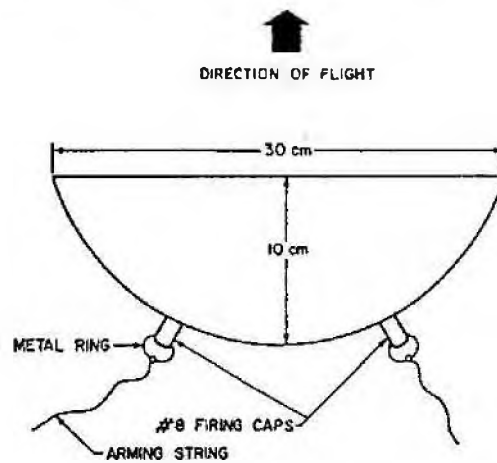
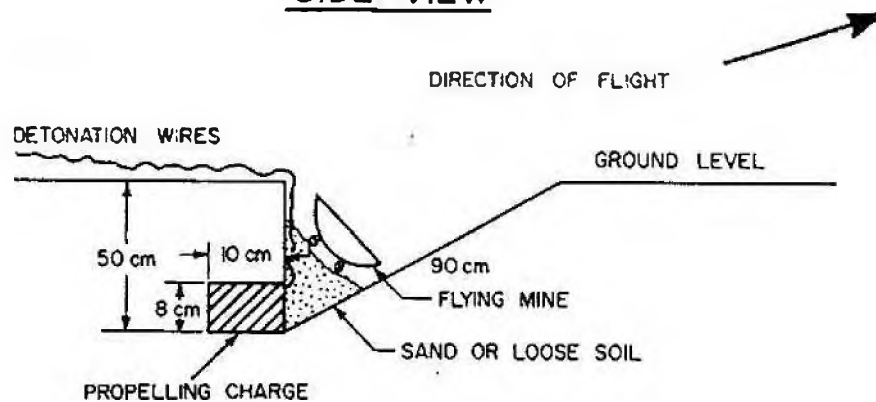


Figure 6-81. Mine, Antipersonnel, "Flying Mine."

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Propelling charge
Diameter: No data Height:	No data	No data	No data	No data	TNT (3.5 lb)

SIDE VIEW



(NOT TO SCALE)

TOP VIEW

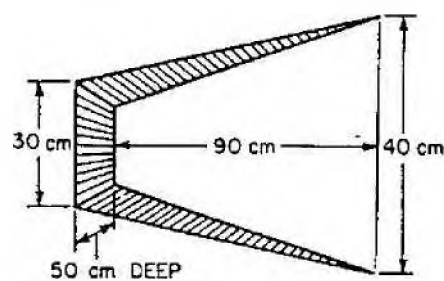


Figure 6-82. Mine, Antipersonnel, "Flying Mine."

a. *General.* A bamboo frame is used as an aiming device and as a pattern template for digging the firing trench. The propelling charge consists of a cylindrical-shaped solid of TNT. The explosive is wrapped in this cardboard and has 2 wires for igniting. Mine is ignited by a generator or battery. (It is not known which is used.) The mine has a range of approximately 200 to 300 meters.

b. *Functioning.* Ignition of the propelling charge accelerates the mine and restraining strings cause the firing caps to activate during the beginning of flight. Detonation of mine is believed to occur on impact.

c. *Installing and Arming.*

(1) Locate the mine approximately 250 meters from target.

(2) Position bamboo template over firing site so that a straight visual sighting resulting from the alinement of the template to the target is obtained. This determines the center axis of the firing trench and establishes bearing to the target.

(3) Dig a wedge-shaped trench (measured from the template) 50 cm deep and slope up to ground level, with length of sides 90 cm. The trench should measure 30 cm wide at ground level.

(4) At the deepest end of the trench, dig out the soil to accommodate the explosive charge.

(5) Insert the charge and extend detonating wires to above ground level.

(6) Place loose soil in the trench to cover approximately 30 cm or $\frac{1}{3}$ of the sloping side.

Placement of Mine and Pre-Ignition Preparations

(7) Fasten a string to each of the 2 firing caps of the charge with the ends fastened to stakes.

(8) Place the mine on top of the charge and soil and aim in the direction up the slope.

(9) Extend ignition wires at least 100 meters and connect to generator or battery in the rear.

(10) Ignite the charge.

6-43. Mine, Antipersonnel, Directional, Fragmentation (Claymore Type) MDH (North Vietnam)

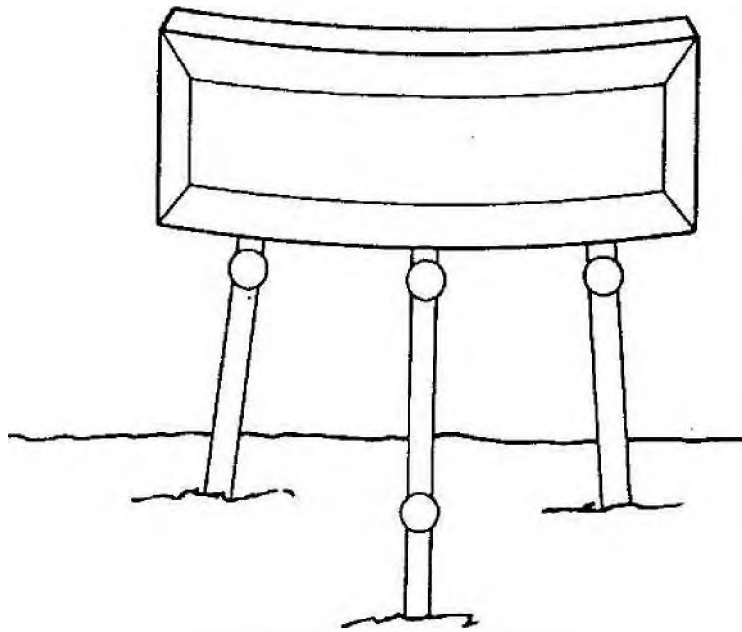
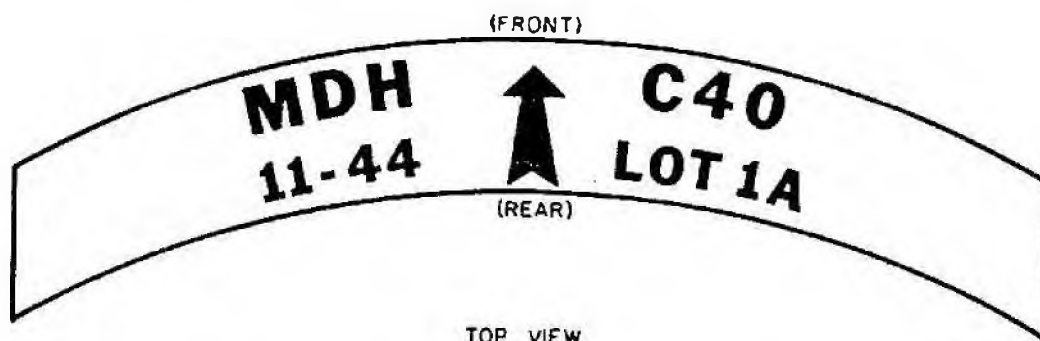


Figure 6-63. Mine, Antipersonnel, Directional, Fragmentation (Claymore Type) MDH.

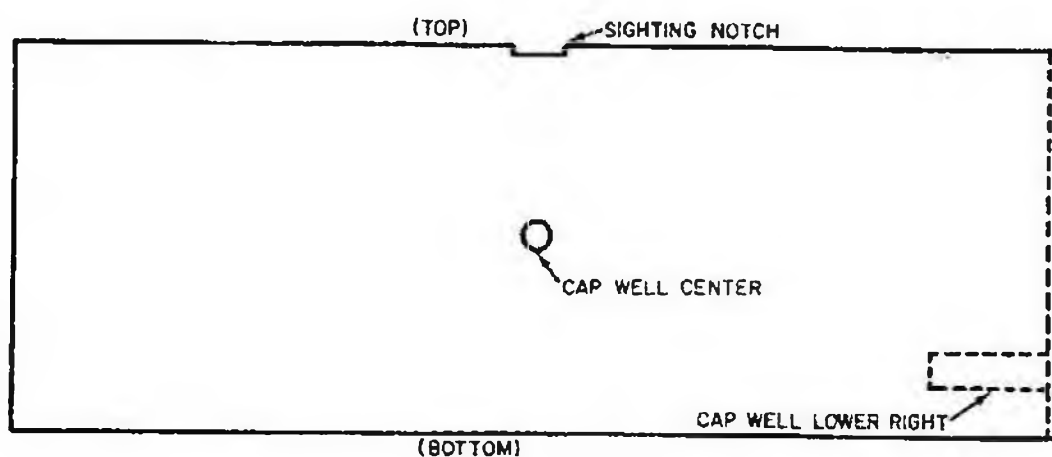
Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Length: 9" Width: 3.375" Thickness: 1.81"	No data	No data	No data	Probably cast TNT	No data

a. General. This mine is a copy of the US Claymore mine (M18).

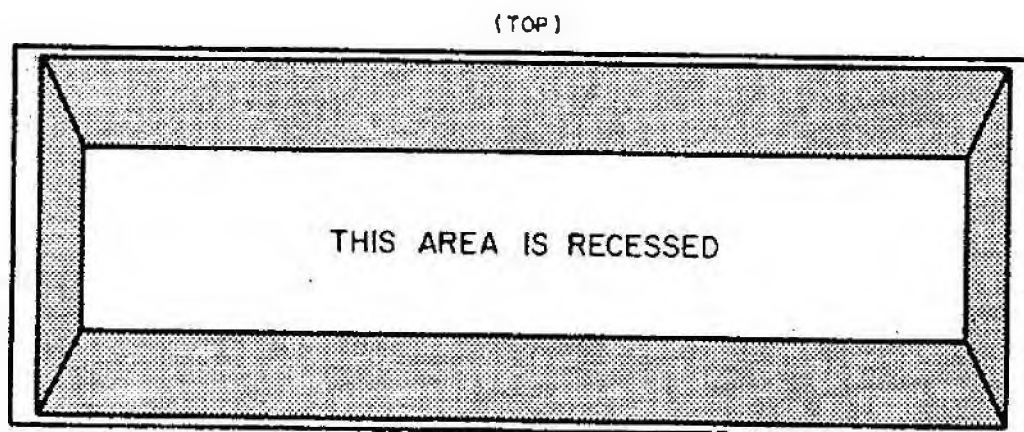
b. Use. The mine is used against personnel and probably has delayed detonation.



NOTE: DIRECTIONAL ARROW IS RAISED ABOVE CASE AND IS MARKED IN RED.



NOTE: THE SUPPORTING LEGS ARE NOT SHOWN



NOTE: SHADED PORTIONS INDICATE THAT THE FACE OF CASE IS RECESSED TO A DEPTH OF 3/16" TOP & BOTTOM BORDERS APPROX 1/16" WIDE.

Figure 6-64. Mine, Antipersonnel, Directional, Fragmentation (Claymore Type) MDH.

6-44. Mine, Antipersonnel, Model Min (North Vietnam)

Illustration furnished for identification purposes.

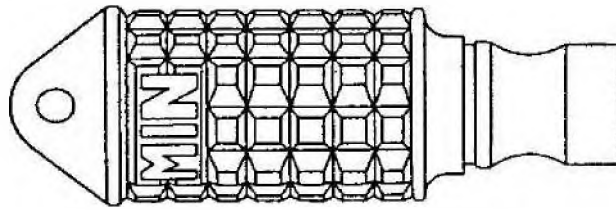


Figure 6-65. Mine, Antipersonnel, Model Min.

General. This mine has a cylindrical, serrated cast iron body.

6-45. Fuze, Fuze-Lighter (Paper) (North Vietnam)

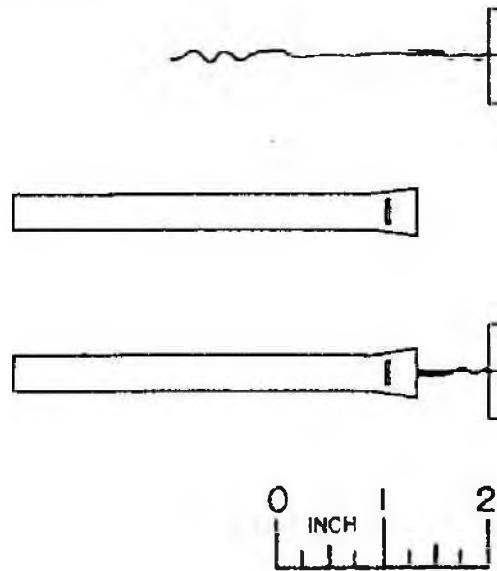


Figure 6-66. Fuze, Fuze-lighter (Paper).

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	Paper	Friction-pull	No data

a. General. Fuze-lighter is of the friction-pull type and has a paper case.

b. Use. Fuze-lighter is used with the mine, anti-personnel, Model Min.

6-46. Mine, Antitank, Plastic (Poland)

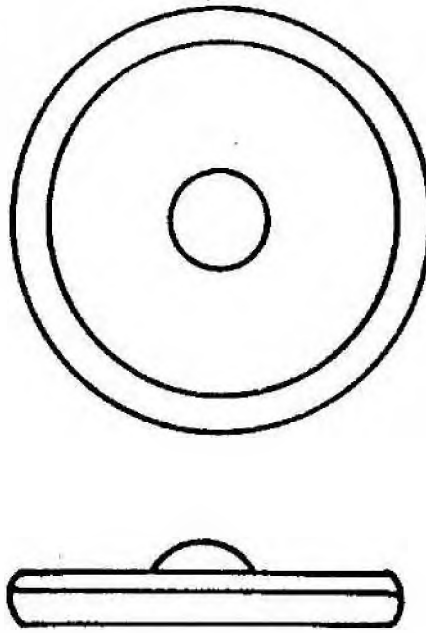


Figure 6-67. Mine, Antitank, Plastic.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12.4" Height: 3.1"	21 oz	No data	No data	No data	No data

General. This is a blast type, with a "teller" type casing. The casing consists of 3 parts: a base (plate type), a cover which screws on the base, and a partitioned insert without a bottom. There

are 2 fuze wells; the main well is top center and the auxilliary well is located on the side of the base.

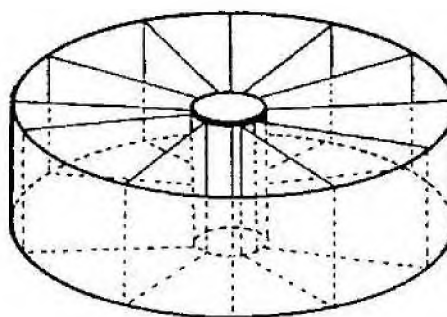
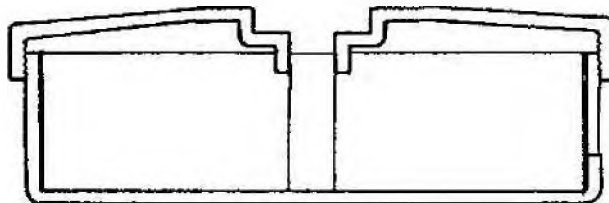


Figure 6-68. Mine, Antitank, Plastic.

6-47. Mine, Antipersonnel, Plastic (Poland)

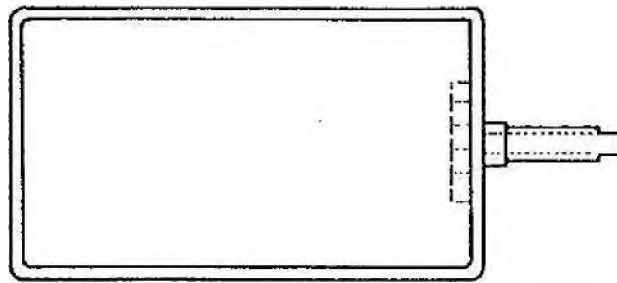


Figure 6-69. Mine, Antipersonnel, Plastic.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 5.4" Height: 2" Width: 2.7" (approx)	8.75 oz	No data	No data	No data	No data

General. This is a blast type mine with a bakelite case. It has 1 fuze well at the end. The brittleness of the bakelite makes the mine more effective,

since, on detonation, it scatters into many small pieces.

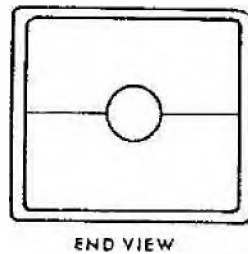
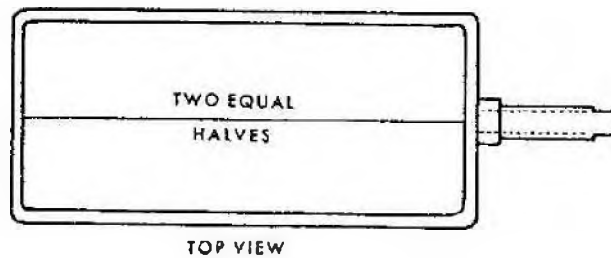
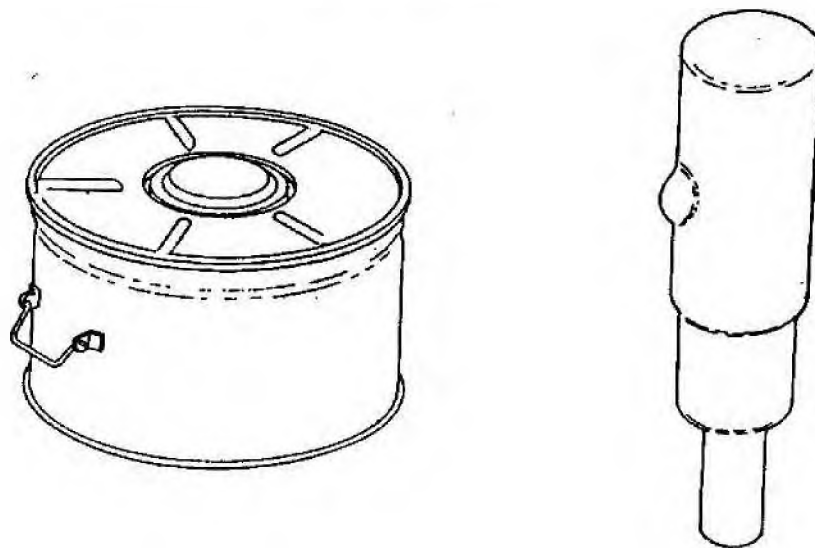


Figure 6-70. Mine, Antipersonnel, Plastic.

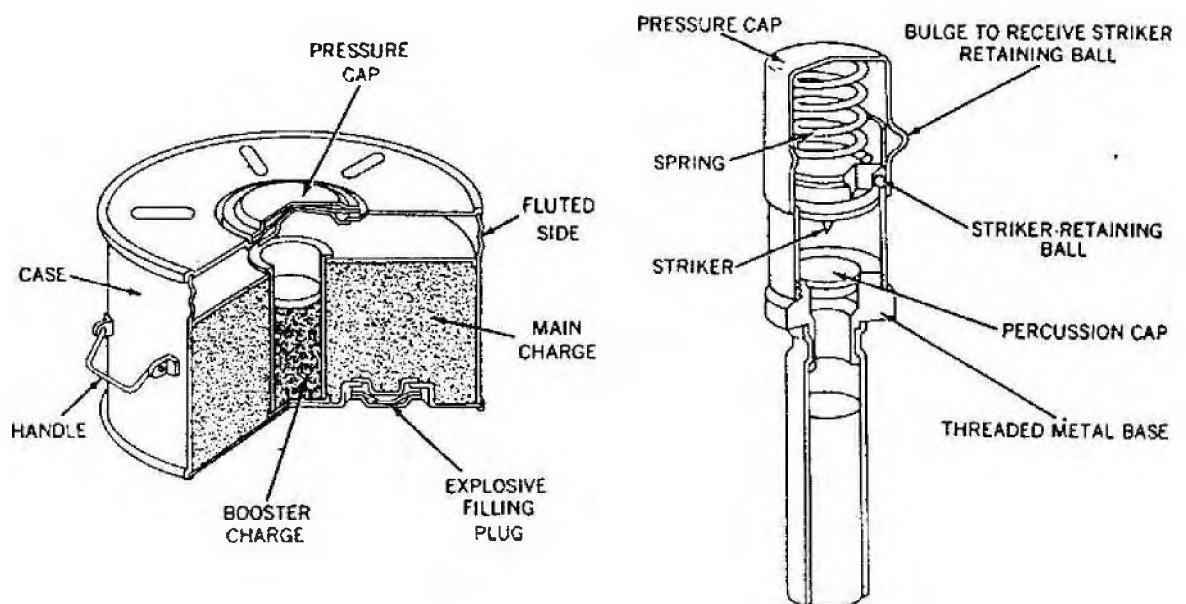
6-48. Mine, Antitank, Metallic, Model TM-41 (USSR)



FUZE MV-5

Figure 6-71. Mine, Antitank, Metallic, Model TM-41.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 9.9" Height: 5.7"	11.9 lb	MV-5 pressure	440 lb	8.4 lb amatol 80/20 or flaked TNT	2.6 oz picric acid



FUZE MV-5

Figure 6-72. Mine, Antitank, Metallic, Model TM-41.

a. General. This is a metal-cased mine fitted with an MV-5 pressure fuze. A fuze well is in top center. Some modifications of the original design have appeared, such as changes in the number of radial ribs on the lid, the size and location of the filling plug, and the number of corrugations around the top side.

b. Use. This mine is usually emplaced in pattern in minefields to immobilize tanks and other vehicles, to protect troops, positions, and equipment, and to halt and delay enemy movement.

c. Functioning. Pressure on the top crushes the corrugated sides of the mine, depressing the sliding head of the fuze until it functions and detonates the mine.

d. Installing and Arming.

(1) Unscrew the pressure cap from the cover of the mine.

(2) Insert an MV-5 fuze and MD-2 detonator assembly into the hole in the booster charge.

(3) Replace the pressure cap.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Unscrew the pressure plug.

(3) Lift the fuze out of the mine case.

(4) Unscrew the detonator assembly from the fuze.

6-49. Mine, Antitank, Wooden, Model TMD-B (USSR)

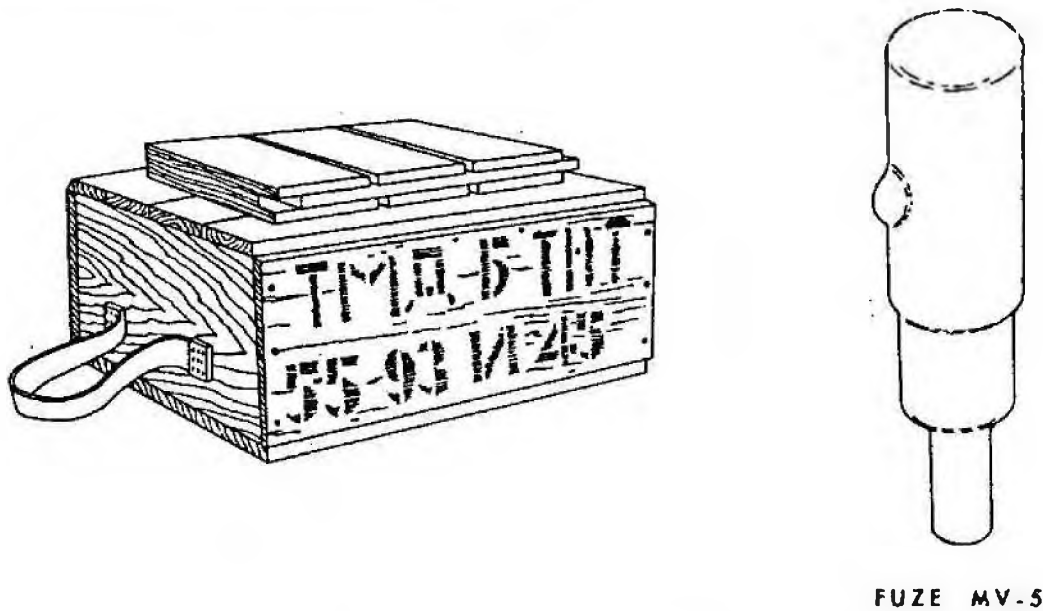


Figure 6-73. Mine, Antitank, Wooden, Model TMD-B.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 12.4" Width: 10.9" Height: 6.4"	16.1 to 19.8 lb	MV-5 pressure	440 lb. approx. depending on condition of case.	11-15 lb. amatol, dynammonite, cast TNT, or picric acid.	7 oz TNT

a. General. This is a standard wooden-cased antitank mine, the sides and bottom of which are nailed together or joined by tongue and groove. The wooden cases may be produced either in the factory or in ordnance field shops according to standard specifications. The hinged pressure board is fastened by a wooden locking-bar placed in grooves made for that purpose.

b. Use. This mine is usually emplaced in pattern in various types of minefields to immobilize tanks and other vehicles, to protect troops, positions and equipment, and to delay or halt enemy advance. It is usually laid with a space of 6 to 9 meters between individual mines and at a density of one mine per meter of front. Two or three mines (or one and a supplementary charge) may be buried in the same emplacement. The TMD-B antitank mine is sometimes converted to antipersonnel use. This mine is also used by North Korea.

c. Functioning. Weight applied on top breaks down the cover at the sawed grooves, transmitting pressure to the pressure block, actuating the fuze, and setting off the mine.

d. Installing and Arming.

(1) Swing the locking strip out from the groove and lift the hinged pressure board.

(2) Place an MV-5 fuze with an MD-2 detonator assembly attached into a 200-gram TNT block and insert into the mine.

(3) Close the hinged pressure board and secure it with the locking strip. For conversion to an antipersonnel mine, place a small wooden block under the booster block, raising the fuze 1.2 to 2.5 centimeters. This causes the hinged pressure board to rest directly on the fuze in a slightly raised position, so that a pressure of about 25 pounds is sufficient for actuation.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Open the locking strip.

(3) Raise the hinged pressure board.

(4) Remove the fuze assembly.

(5) Unscrew the detonator.

f. Precautions. Although disarming methods are presented here, their use is not recommended, as the mine is often boobytrapped.

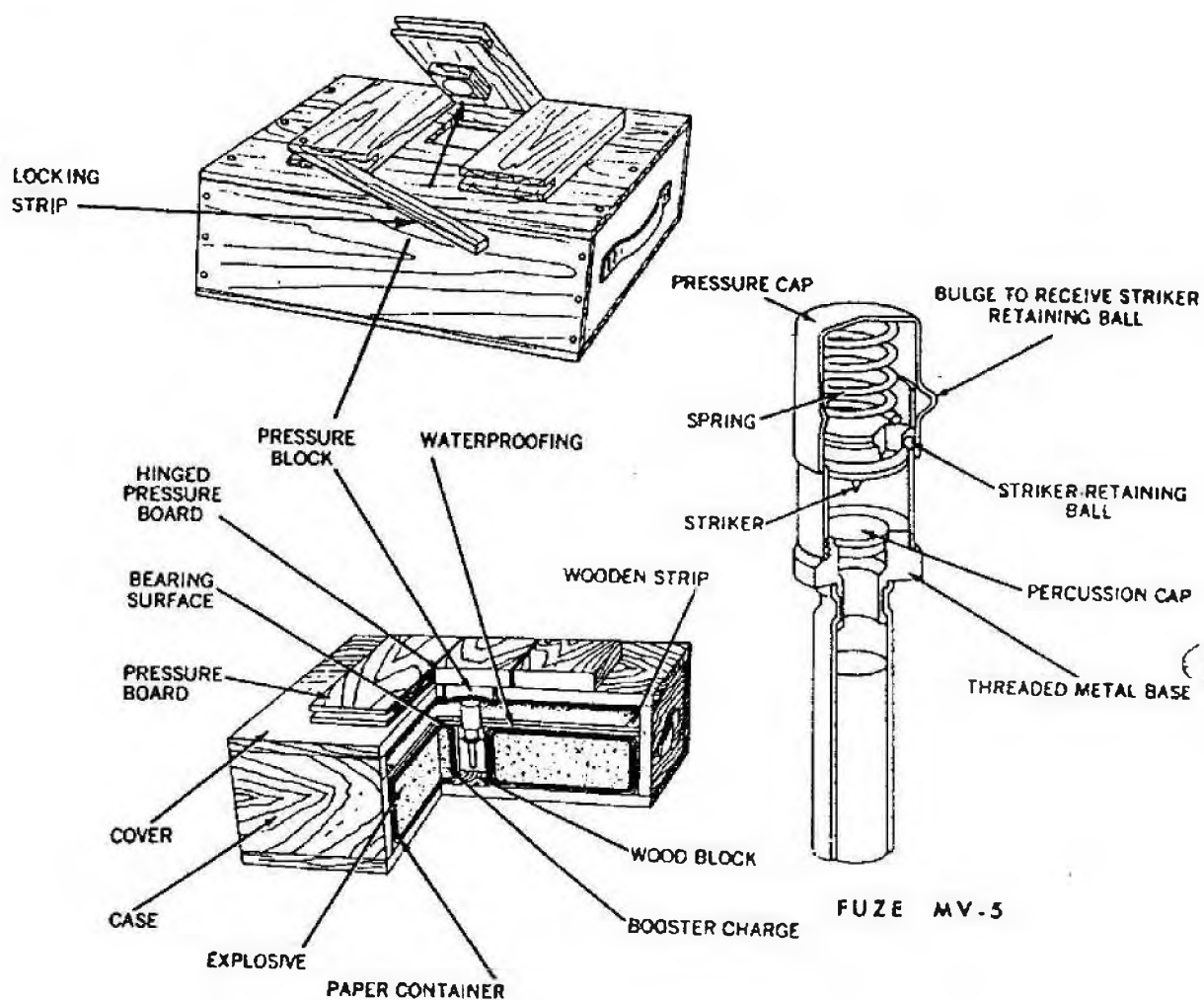
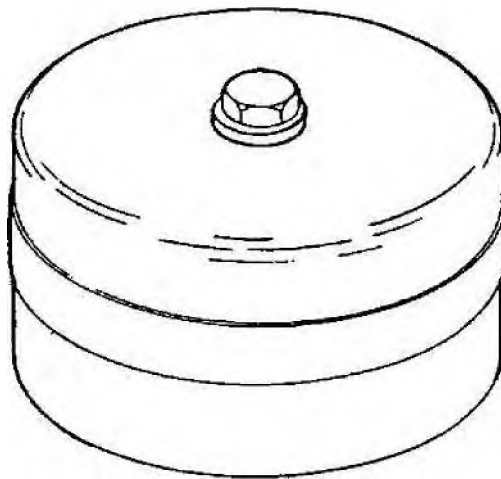


Figure 6-74. Mine, Antitank, Wooden, Model TMD-B.

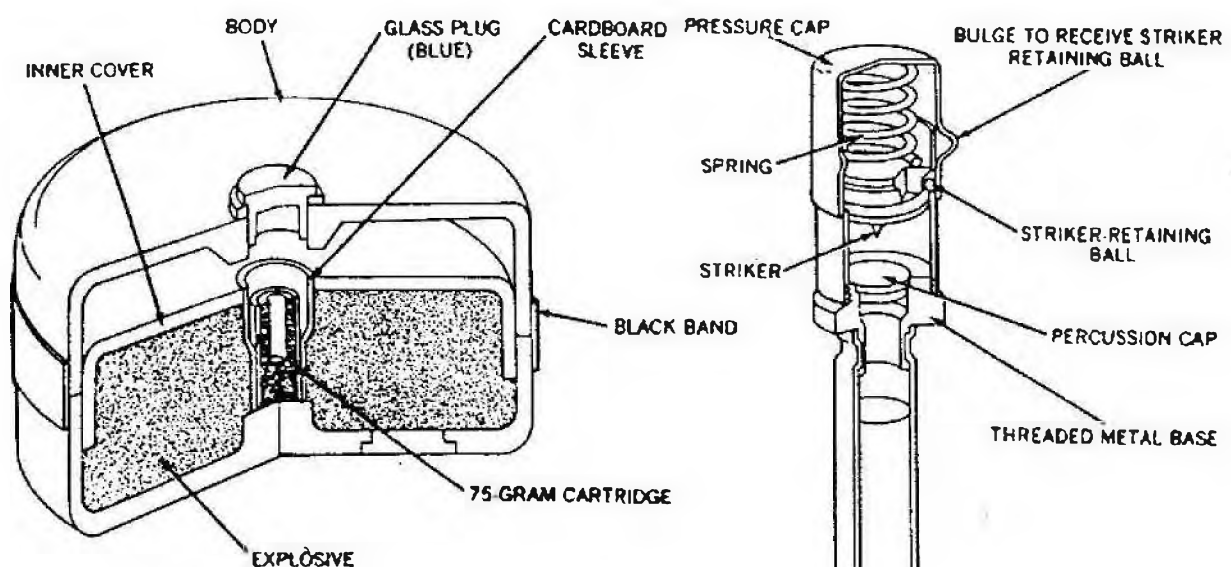
6-50. Mine, Antitank, Paper, Model TMB-2 (USSR)



FUZE MV-5

Figure 6-75. Mine, Antitank, Paper, Model TMB-2.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 10.8" Height: 6.1"	15.4 lb	MV-5 pressure	26 lb.	11 to 14.5 lb TNT or amatol	4 oz Tetryl or TNT



FUZE MV-5

Figure 6-76. Mine, Antitank, Paper Model TMB-2.

a. General. The TMB-2 antitank mine is encased in tar-impregnated cardboard, sealed with tape and a coating of asphalt. This mine is designed to make electronic detection difficult, if not impossible.

b. Use. This mine is frequently used along with metal or wooden mines to remain armed and undetected in a supposedly cleared minefield.

c. Functioning. The application of force on the glass pressure plug on top of the case actuates the fuze and detonates the mine.

d. Installing and Arming.

- (1) Unscrew the glass fuze well cap.

- (2) Insert the booster charge, hole end up, into the fuze well.

- (3) Screw an MD-2 detonator to the base of an MV-5 fuze and insert detonator end first, into the booster charge.

- (4) Replace the glass fuze well cap.

e. Disarming.

- (1) Check for and remove any antilift devices.

- (2) Unscrew the glass fuze well cap.

- (3) Pull out the fuze and detonator assembly.

- (4) Unscrew the fuze from the detonator.

f. Precautions. The safest procedure is the destruction of the mine in place.

6-51. Mine, Antitank, Wooden, Model YaM-5 (USSR)

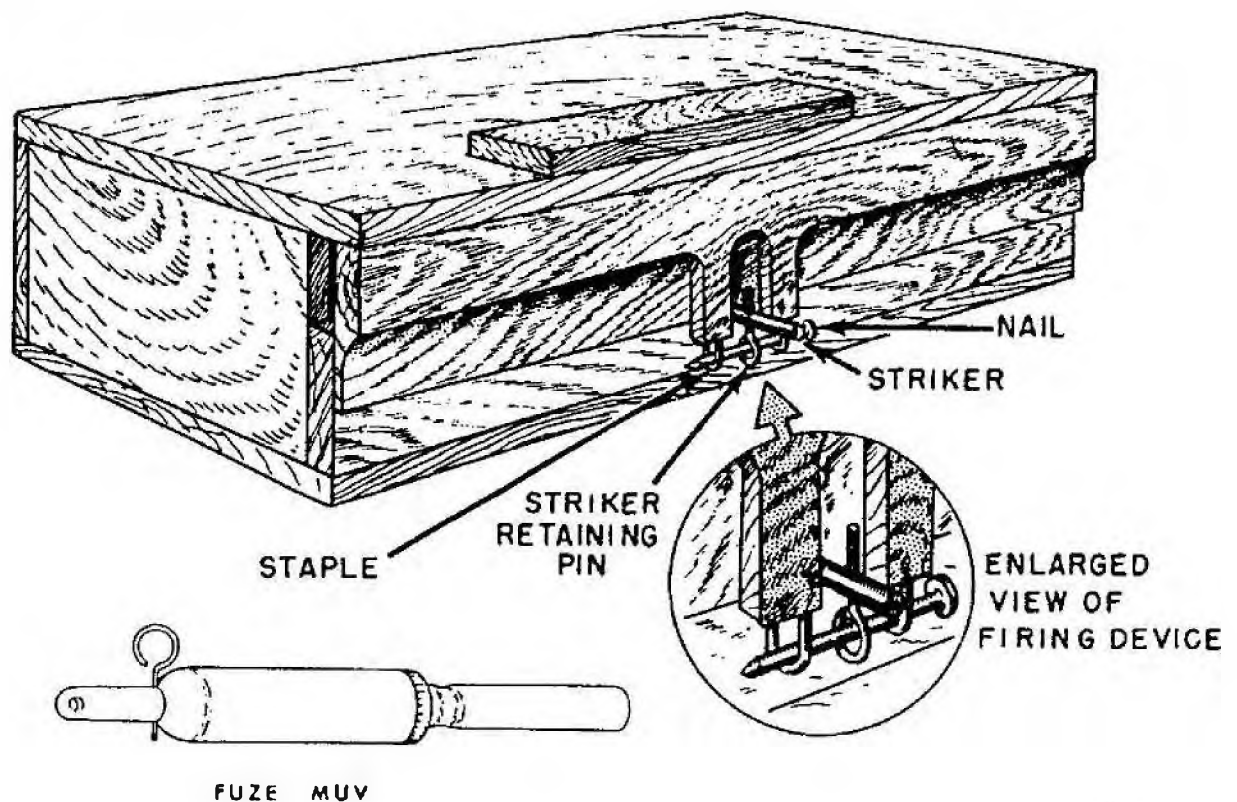


Figure 6-77. Mine, Antitank, Wooden Model YaM-5.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 19.5" Width: 7.4" Height: 3.7"	13-15 lb	Model MUV pull	300 lb	11 to 12 lb Amatol ammonite	7 oz TNT

a. General. This antitank mine is one of the most widely used of all the nonmetallic types. Four models are produced; all are basically similar but differing slightly in weight and dimensions. The main feature is the hinged lid lip which overlaps the box and is recessed in the center to fit over the protruding end of the pull fuze striker. Two staples are provided, one placed on each side of the recess, to accommodate a pin that passes through the eye of the striker retaining pin. In this case the pull fuze is actuated by pressure.

b. Use. These mines are generally emplaced in pattern to immobilize tanks and other vehicles, to protect various troops, positions, and equipment, and to halt and delay enemy advance.

c. Functioning. Application of approximately 300 pounds of pressure on the lid collapses it, forcing the overlapping edge down. The wooden peg (or nail or wire) passed through the eye of the striker retaining pin is also pushed down, removing the striker retaining pin and actuating the fuze. Some of these mines may have sawed grooves on the underside of the lid, which reduce the required operating pressure to much less than 300 pounds.

d. Installing and Arming.

(1) Lift the lid and insert the booster charge.

(2) Insert an MUV pull fuze, with detonator attached, through the wooden fuze-holder block, so that the detonator projects into the hole in the booster charge and the eye of the striker retaining pin is down.

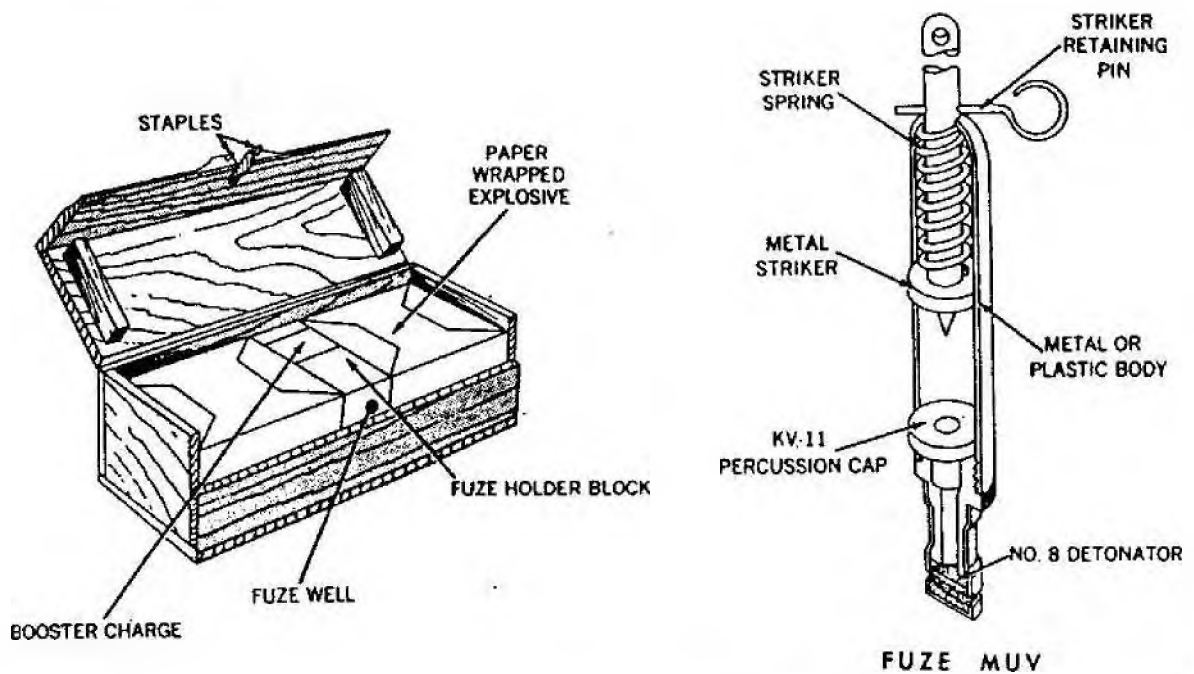


Figure 6-78. Mine, Antitank, Wooden, Model YaM-6.

(3) Close the lid.

(4) Slide a wooden peg, nail, or piece of wire through the staples and the eye of the striker retaining pin.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Remove peg, nail, or wire from the staples and eye of the striker retaining pin.

(3) Lift the lid, pull out the fuze, and unscrew the detonator.

f. Precautions. As improvised boobytrapping of this mine is easy, it should be blown in place, except when silent lifting is required.

6-52. Mine, Antitank, Metallic, Model TM-46 (USSR)

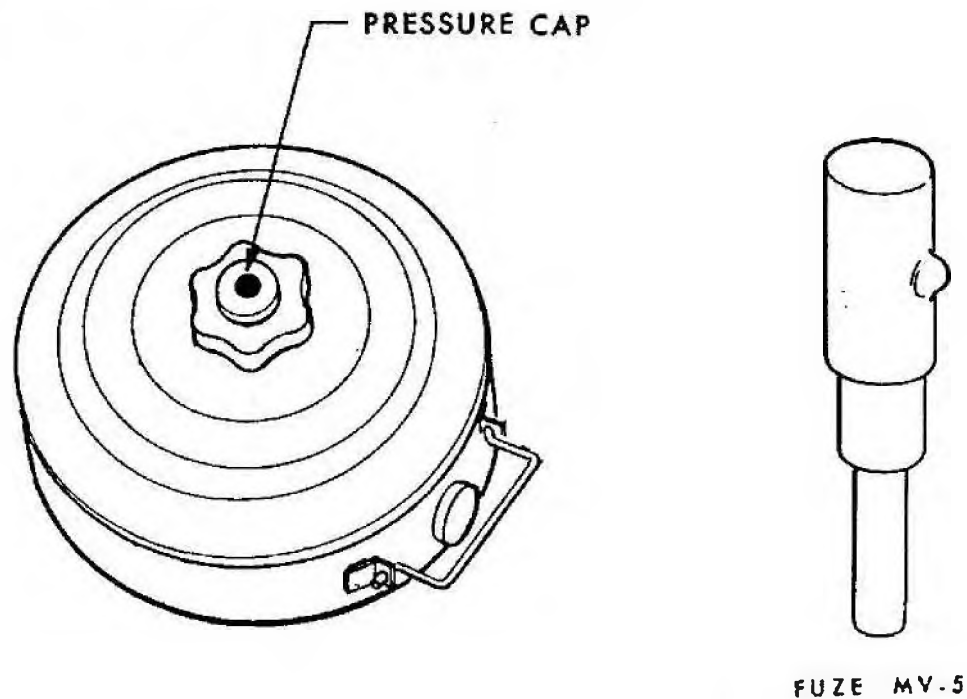


Figure 6-79. Mine, Antitank, Metallic, Model TM-46.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.7" Height: 2.88	19.2 lb	Model MV-5, pressure	400 lb approx.	12.6 lb. TNT	7 oz. TNT

a. General. This metallic mine may be emplaced under water in creek or river beds and be distributed mechanically. It uses an MV-5 fuze but has no means of external arming for mechanical laying. The TM-46 has a secondary fuze well in the side underneath the carrying handle.

b. Use. The TM-46 is laid in antitank minefields or as in *a* above.

c. Functioning. Pressure forces the pressure cap down on the head of the fuze, depressing it and releasing the striker to detonate the mine.

d. Installing and Arming.

- (1) Unscrew the fuze well cover.
- (2) Insert the MV-5 fuze with MD-2 detonator assembly.
- (3) Replace the fuze well cover.

e. Disarming. This mine is extremely dangerous to disarm, as it may contain a pressure-release

fuze or one of some other anti-disturbance type which cannot be determined without removing the pressure cap. Destroy the mine in place. If this is tactically undesirable:

- (1) Search for and remove any antilift devices.
- (2) Remove the mine from a defilade position by means of a wire cable or rope, and destroy.

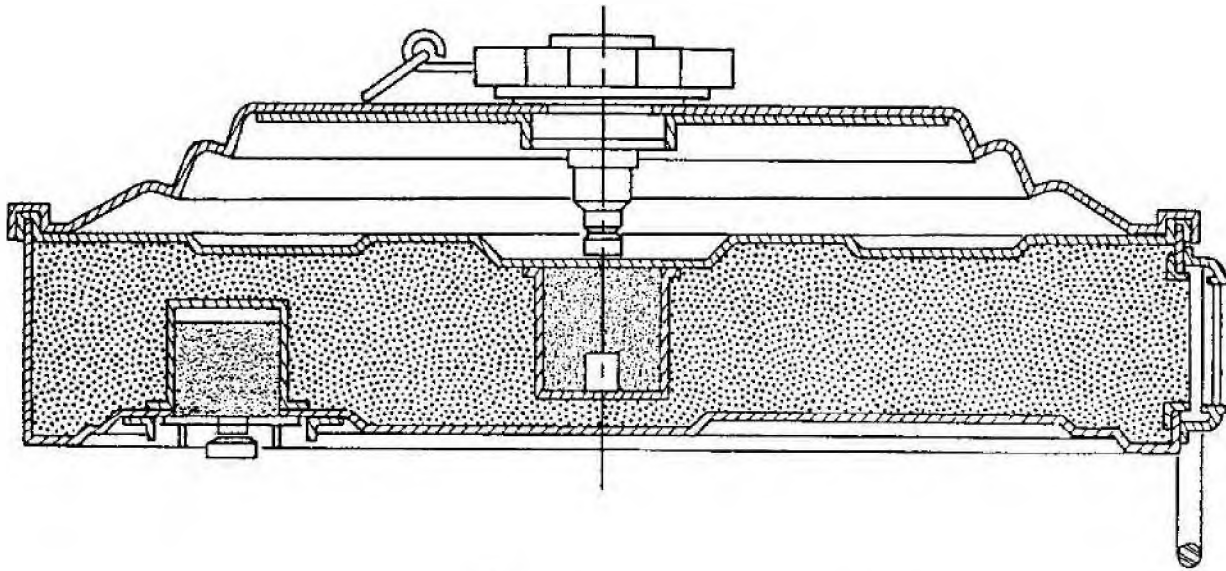
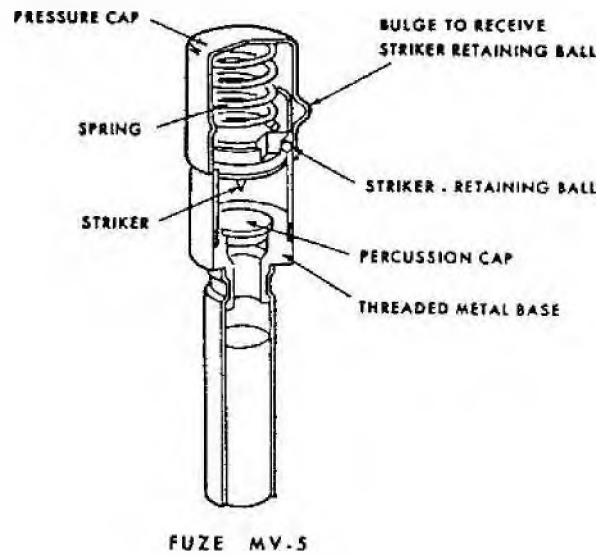


Figure 6-80. Mine, Antitank, Metallic, Model TM-46.

6-53. Mine, Antitank TMN-46 Antilift (USSR)

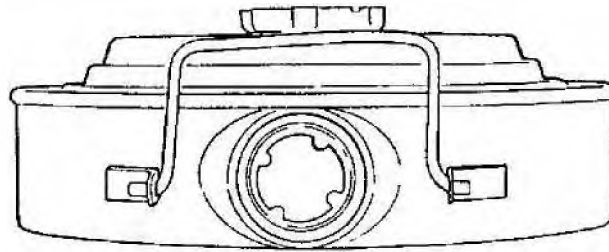


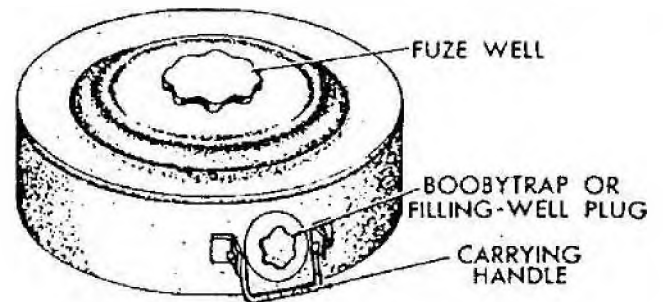
Figure 6-81. Mine Antitank TMN-46 Antilift.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 3"	19.18 lb	MV-5 MV-4? MVM?	No data	TNT 13.06 lb	Tetryl 1.4 oz top fuze well 1.3 oz bottom fuze well

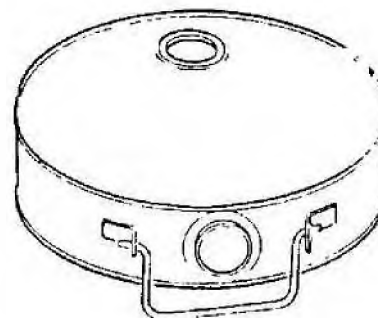
a. *General.* The mine body is sheet steel and the mine is assumed to be waterproof. The pressure plate is integral with the mine case. The mine has a centrally located fuze well on top and a filling hole directly beneath the handle. A second fuze well is located on the bottom, presumably for antilift or boobytrapping purposes.

b. *Use.* Same as Soviet TM-46 (para 6-50).

c. *Functioning.* Actuation pressure results from the deflection and/or shearing of the pressure plate with respect to the mine case. When the required load is applied on the pressure plate, it actuates the fuze, thus initiating the explosive train and the main charge.



TOP VIEW



BOTTOM VIEW

Figure 6-82. Mine, Antitank TMN-46 Antilift.

6-54. Mine, Antitank, TMD-44 (USSR)

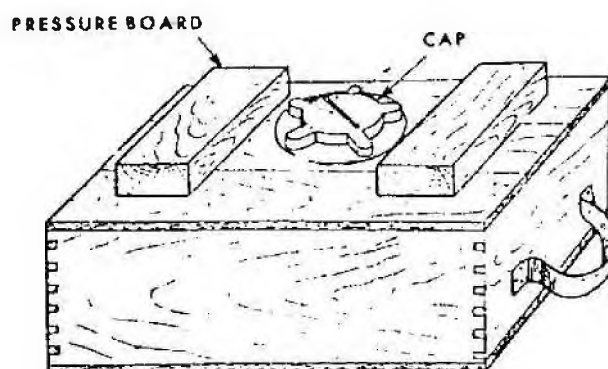


Figure 6-83. Mine, Antitank, TMD-44.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 13" approx. Height: No data	22 lb approx.	Pressure	22 lb. approx.	TNT 11-15½ lb.	No data

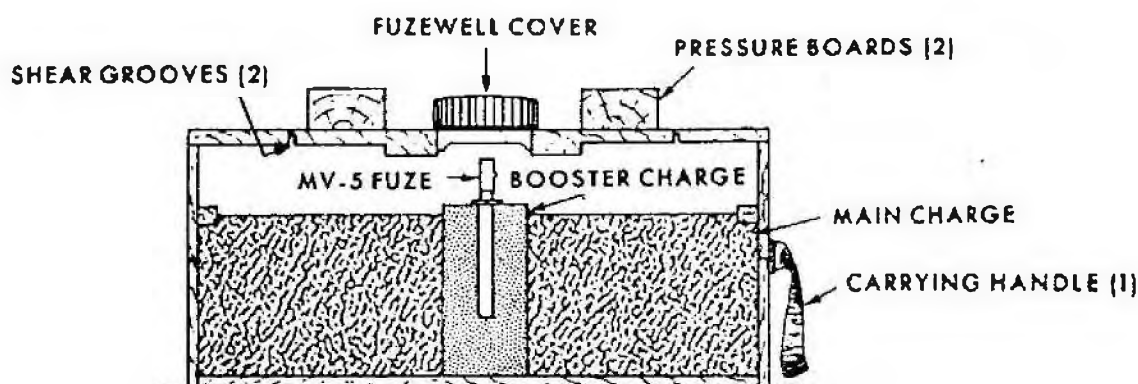


Figure 6-84. Mine, Antitank, TMD-44.

a. *General.* This blast type mine is similar to the Soviet TMD-B and, like the TMD-B antitank mine, its dimensions and weights vary because of its construction. It has one fuze well located at top center and uses a MV-5 pressure fuze.

b. *Use.* Used as a field fabricated mine as a supplement to standard items.

c. *Functioning.* When pressure crushes the wooden boards, the cap of the fuze is depressed

providing a recess for the striker retaining ball. The spring-loaded striker is released when the striker retaining ball moves into the recess.

d. *Installing and Arming.*

- (1) Remove the fuze well cover.
- (2) Insert the fuze with detonator in the well.
- (3) Replace the fuze well cover.

6-55. Mine, Antitank Rocket, LMG (USSR)

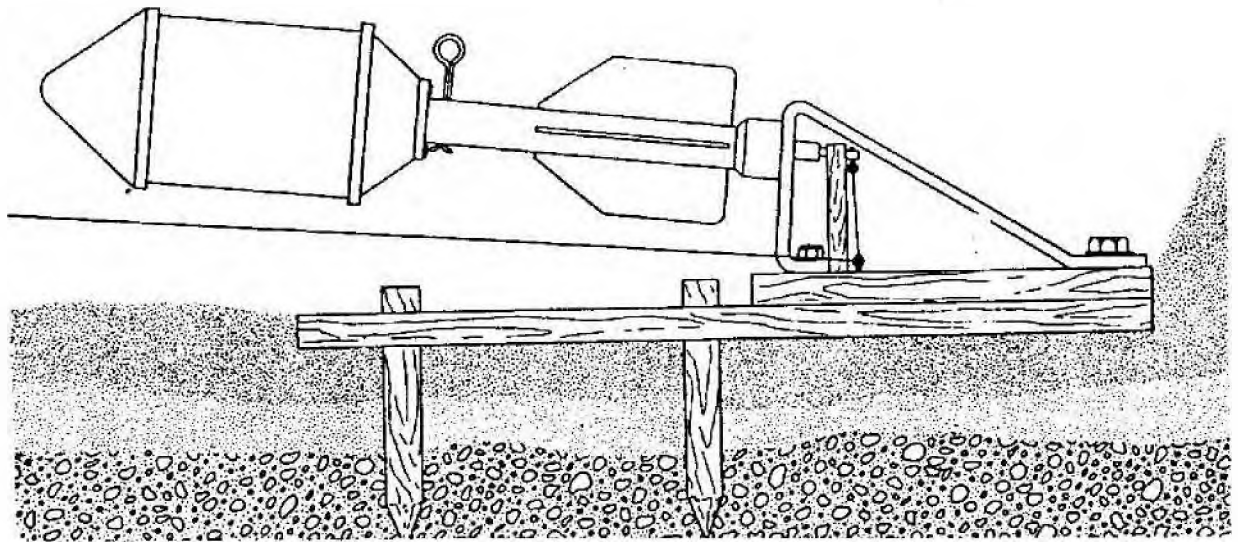


Figure 6-85. Mine, Antitank Rocket, LMG.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: Height:	22 lb	MUV Pull and impact	No data	7.16 lb	TNT 1.75 oz

a. General. The LMG rocket mine, which functions as a statically-operated bazooka, delivers a projectile or rocket from a mounting on a wooden

platform placed in a shallow trench in the ground. It is aimed at a probable tank approach. The device is fired by a force pulling or breaking a

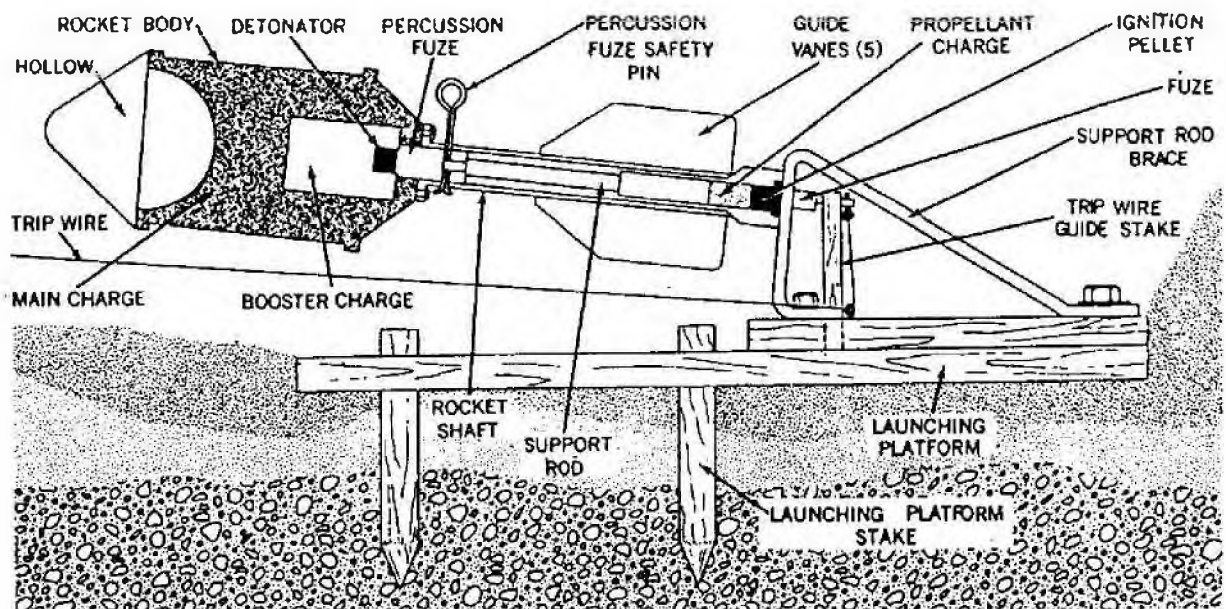


Figure 6-86. Mine, Antitank Rocket, LMG.

wire attached to an MUV pull fuze in the rocket base. An impact fuze is also included in the rocket for detonation at impact.

b. Use. The rocket antitank mine is used to penetrate the side armor of tanks. Units are usually spaced about 30.5 meters apart.

c. Functioning. A pull on the tripwire by a moving tank or a concealed observer, sets off the ignition pellet and detonates the propelling charge. The impact fuze is actuated when the rocket strikes the tank.

d. Installing and Arming.

(1) Dig a shallow trench about 25 to 30 centimeters deep, 20 centimeters wide, and 75 centimeters long, sloped in the direction in which the rocket will travel and at such an angle that the rocket in flight will not exceed a height of 1.5 meters above the ground.

(2) Lay the rocket platform in the trench and stake it down.

(3) Insert the propellant charge and ignition pellet within the rocket shaft.

(4) Install the rocket on the support rod brace on the platform.

(5) Insert an MUV pull fuze and MD-2 detonator assembly through the hole in the end of the support rod base and into the rocket shaft.

(6) Attach the pull wire to the striker release pin. For controlled actuation, extend the pull wire to the concealed observation point; for noncontrolled actuation, extend the pull wire in the direction the rocket is aimed and lay it in groove-topped stakes spaced about 6.5 meters apart and 40 centimeters above the ground. Wire should cross the vehicle path or road at a height of 25 centimeters. Anchor the pull wire to a stake or some other stationary object.

(7) Remove the safety pin from the impact fuze in the rocket.

e. Disarming.

(1) Cut the pull wire near the MUV fuze.

(2) Insert a nail or wire in the safety pin hole in the impact fuze.

(3) Remove the fuze and detonator assembly.

(4) Unscrew the detonator.

5-56. Mine, Anti-Ship, Limpet (Nonmetallic) (Magnetic) (USSR)

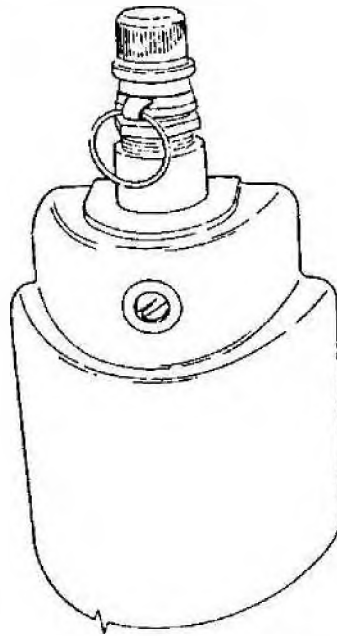


Figure 6-87. Mine, Anti-Ship, Limpet (Nonmetallic) (Magnetic).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 10.6" Diameter: 4.5"	6.3 lb w/o fuze	Mech time delay	Not applicable	Tritanol 2.1 lb	RDX

a. *General.* This is a molded plastic semi-cylindrical limpet mine which uses a mechanical time delay (metal fatigue) fuze. Delay can be set from 5 minutes to 832 hours by use of 6 delay tabs. The mine has two horseshoe magnets on both ends. The mine has 2 fuze wells and an arm-

ing device 180° from the fuze wells. A cylindrical cavity charge is mounted on a bridge supported by the 2 horseshoe magnets. The magnets provide a standoff of 1.6 cm.

b. *Use.* The mine is used for disabling or sinking ships.

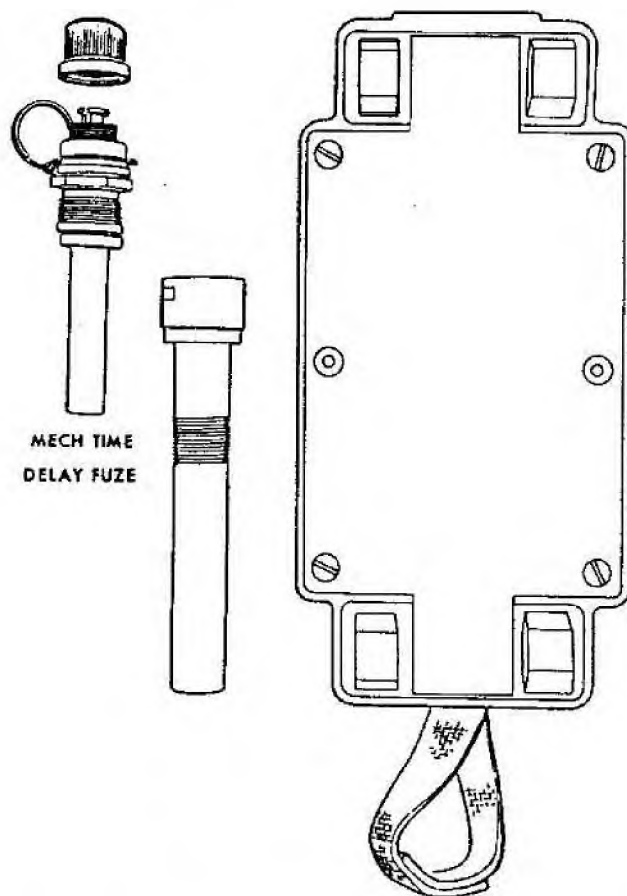


Figure 6-88. Mine, Anti-Ship, Limpet (Nonmetallic) (Magnetic).

c. Functioning. The initiating device is a machined, anodized, aluminum, mechanical time device operating by spring pressure. A pull of the safety ring releases a strong spring. The force of the spring is restrained by a wire which passes around the delay tab. Depending on the temperature and the thickness of the tab, the wire takes a predetermined time to cut through the tab. When the wire cuts through the tab, the spring is re-

leased and drives the firing pin into the detonator, exploding the mine.

d. Disarming.

(1) Mines require about 20 lb pull to detach from ship. Use a sliding and away motion.

(2) *If time permits*, disarm the mine by unscrewing the initiating device and removing it from the well.

6-57. Mine, Anti-Ship, Magnetic "Turtle" (USSR)

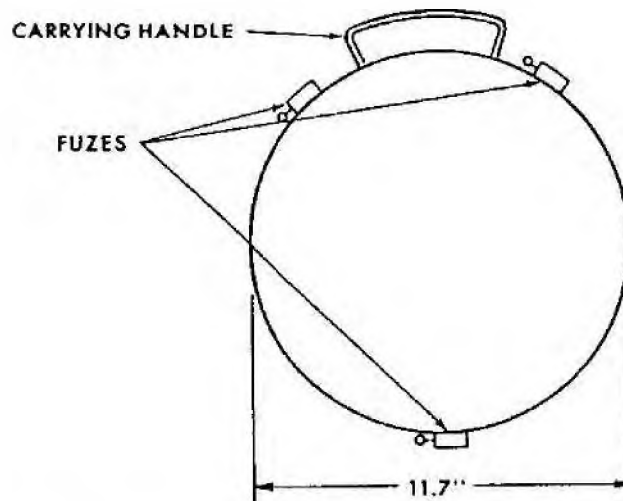


Figure 6-88. Mine, Anti-Ship, Magnetic "Turtle".

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.7" approx. Height: 7" approx.	15 lb	Detonator and anti-disturbance	NA	TNT 6.6 lb	No data

a. *General.* The anti-ship "Turtle" mine is hemispherical in shape. Its flat-surfaced bottom is magnetized with two rows of circular magnets mounted nearly flush with the mine's bottom surface. After being attached by the magnetized bottom to a metal surface, an approx. 45 lb pull is required to pull the mine loose. A folding handle is attached near the bottom. The mine has 3 separate fuzes—two main detonator fuzes and 1 anti-disturbance fuze. The mine can blow a hole 2 feet in diameter in the average ship.

b. *Use.* The mine is attached to a ship's side, below the waterline, to damage or sink the ship.

c. *Functioning: Time-Delay Fuzes.* The two identical time-delay fuzes (to insure detonation if one fails) can be set for 5 different time delays—from 15 minutes to 12 hours. With the safety pin removed, the spring tension begins to exert a downward pull upon a metal cutting surface which then slowly cuts through a soft wire. With the severing of the wire, the firing pin is released and strikes the detonator cap. The time delay is effected by the softness and thickness of the wire. *Antidisturbance fuze.* This fuze operates similarly to the time-delay (detonator) fuzes. However, the wire to be severed is so thin and soft that it is severed almost instantly when the safety pin is

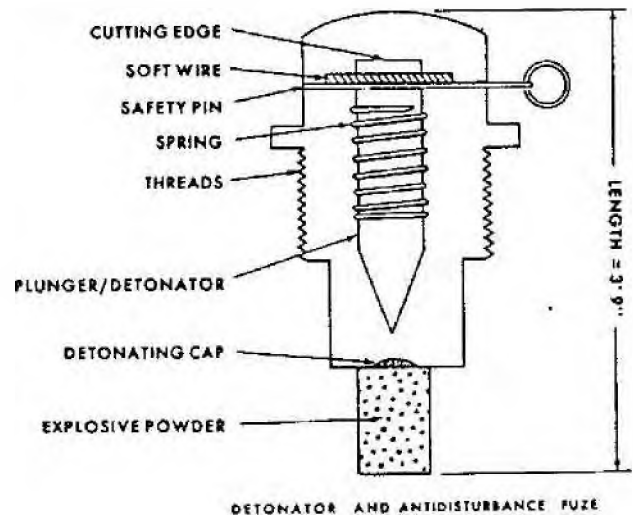


Figure 6-90. Mine, Anti-Ship, Magnetic "Turtle".

pulled. Two carefully balanced metal plates keep the plunger from striking the cap and premature explosion. If the mine is moved, the metal plates dislodge and release the detonator plunger.

d. *Installing and Arming.*

(1) Attach mine to ship's side, amidships, below the waterline.

(2) Remove safety pins of time-delay detonator fuzes.

(3) Remove safety pin of antidisturbance fuze.

e. Precautions. Do not disturb or move the mine on the ships' side after the safety pin of the anti-disturbance mine has been removed.

6-58. Limpet, BPM (USSR)

Illustration furnished for identification purposes.

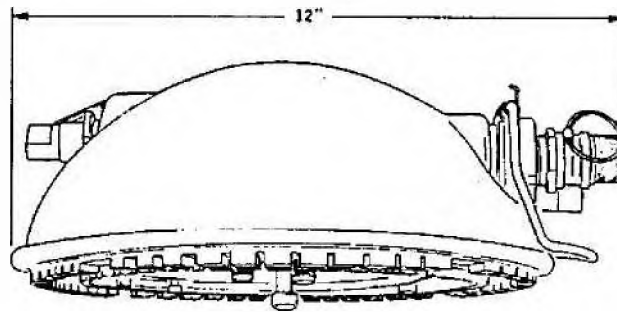


Figure 6-91. Limpet, BPM.

6-59. Mine, Antipersonnel, Metallic, Model POMZ-2 (USSR)

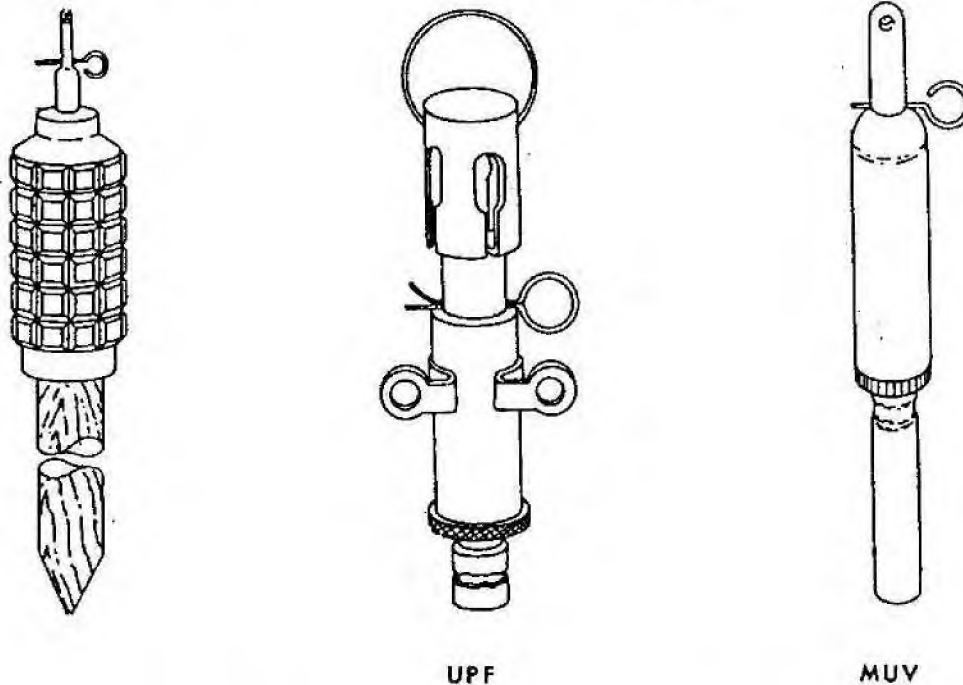


Figure 6-82. Mine, Antipersonnel, Metallic, Model POMZ-2.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.3" Height: 5.2"	4.4 lb.	MUV pull or VPF	2.2 lb or more	2.6 oz TNT	N/A

a. *General.* This has been one of the most commonly used Soviet metal-cased antipersonnel mines. The mine consists of a wooden stake, a cast iron body and a cylinder of cast TNT. Originally the fuze well was not threaded and a groove was cut in the stake to allow water to drain from the mine. A later model, the POMZ-2M has a threaded fuze well. This mine has been widely copied. It employs the MUV or VPF fuze.

b. *Use.* POMZ-2 mines are mounted on stakes at a height of about 25.5 centimeters above the ground in high grass, bushes, or woods. Occasionally they are interspersed in antitank minefields.

c. *Functioning.* If fitted with the MUV fuze, a pull on the tripwire removes the striker retaining pin, releasing the spring-driven striker against the percussion cap. If fitted with the VPF fuze, a pull on the tripwire removes the pullring from the round head of the striker bolt, releasing the spring-loaded striker against the percussion cap.

d. *Installing and Arming.*

- (1) Drive the mounting stake about halfway into the ground.
- (2) Put the charge in the large open end of the shell.
- (3) Place the mine on the stake.
- (4) Screw a detonator on the base of the MUV or VPF pull fuze and insert assembly in hole in top of the mine.
- (5) Attach the tripwire to an anchor and then to the MUV striker retaining pin or the VPF pull ring.

e. *Disarming.*

- (1) Cut the tripwires.
- (2) Pull out the fuze-detonator assembly.
- (3) Unscrew the detonator.

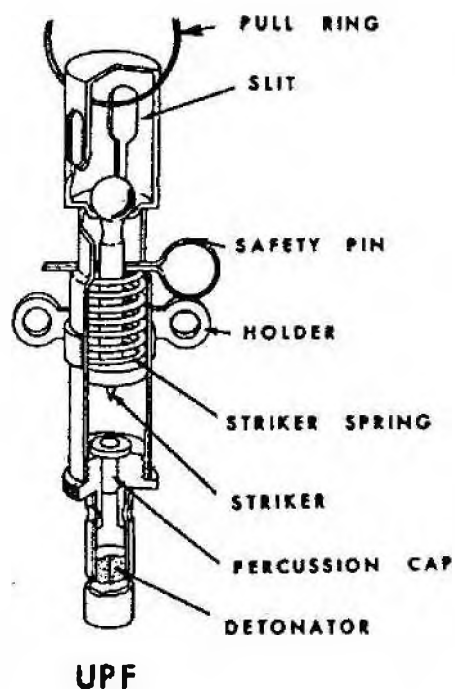
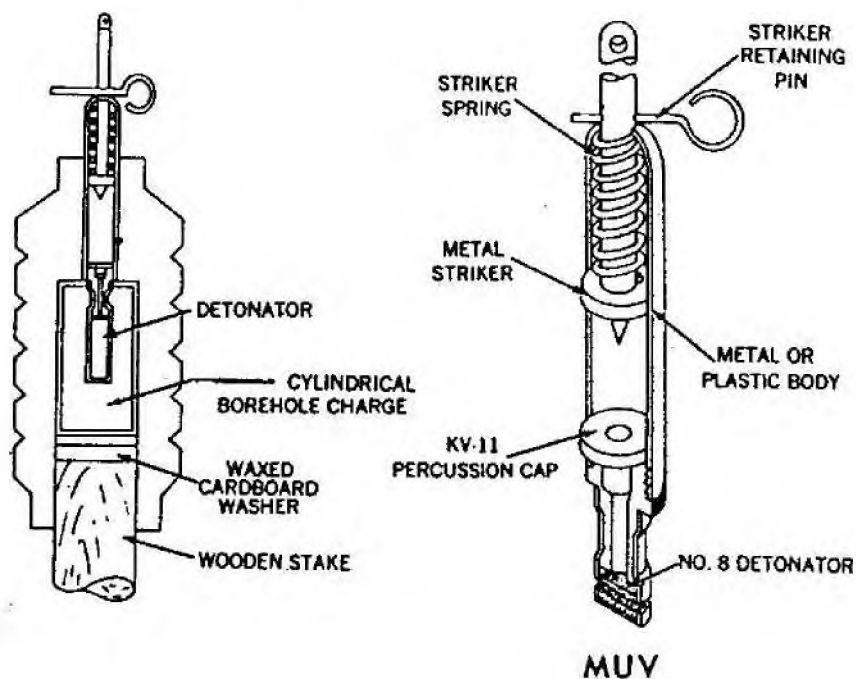


Figure 6-99. Mine, Antipersonnel, Metallic, Model POMZ-2.

f. Precautions. This mine may be rigged for tension release action by holding the fuze striker in cocked position by a taut trip wire instead of a

striker retaining pin. Under such conditions the striker retaining pin or substitute should be replaced before the trip wire is cut.

6-60. Mine, Antipersonnel, Cardboard, Model PMK-40 (USSR)

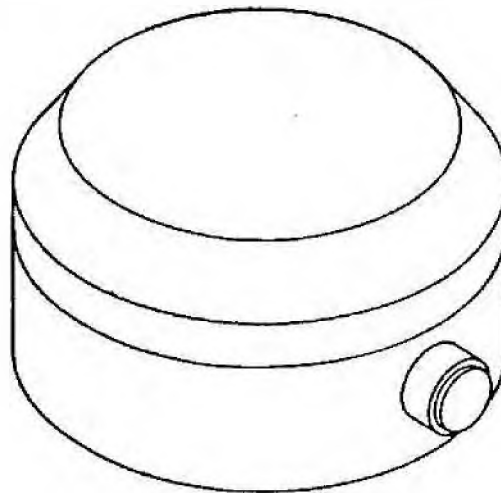


Figure 6-94. Mine, Antipersonnel, Cardboard, Model PMK-40.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.7" Height: 1.5"	3.2 oz	Integral pressure	20 to 40 lb.	1.8 oz TNT	No data

a. General. This antipersonnel mine, which looks much like a shoe polish can, has a waxed cardboard case. It contains a small charge of TNT and an integral pressure fuze. It is similar to the British "ointment box" and the more complicated United States Model M14. The Soviets also had a metallic model, which was the earlier of the two designs.

b. Use. These mines are frequently scattered in front of antitank minefields or laid along trails, paths, and roadside ditches.

c. Functioning. Pressure on the lid depresses the lever, which releases the spring-driven striker against the percussion cap.

d. Installing and Arming.

- (1) Remove the rubber or cork plug at the side of the mine.
- (2) Insert the percussion cap and detonator assembly into the horizontal detonator well.
- (3) Replace the plug.

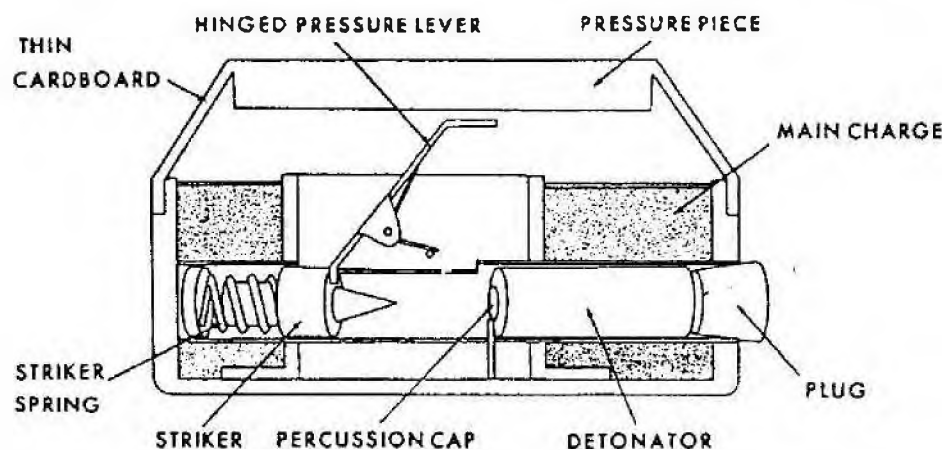
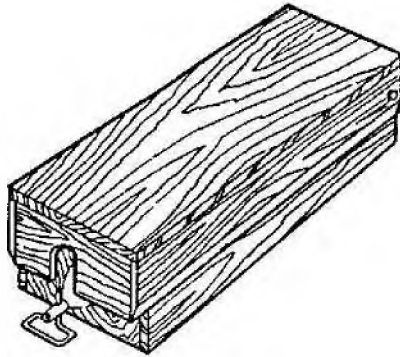


Figure 6-95. Mine, Antipersonnel, Cardboard, Model PMK-40.



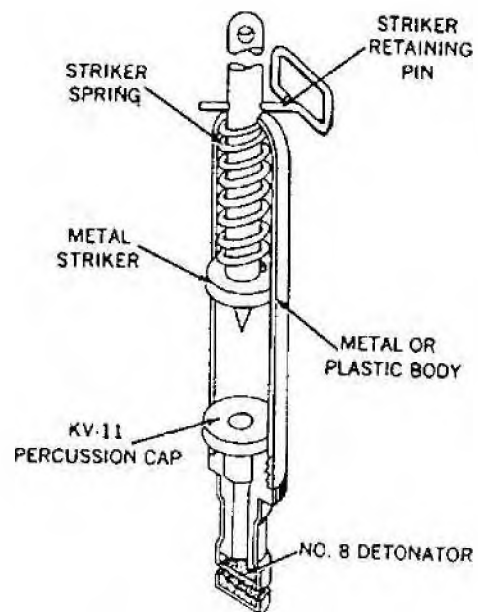
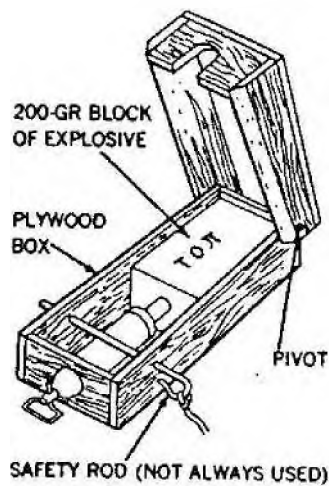
6-61. Mine, Antipersonnel, Wooden, Model PMD-6 (USSR)



MUV PULL FUZE

Figure 6-96. Mine, Antipersonnel, Wooden, Model PMD-6.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 7.4" Width: 3.5" Height: 2.5"	14 oz	MUV pull	2 to 10 lb	7 oz TNT or mortar grenade	No data



MUV PULL FUZE

Figure 6-97. Mine, Antipersonnel, Wooden, Model PMD-6.

a. General. The PMD-6 is a wooden-cased mine with a hinged lid that overlaps the sides. A deep groove is cut in the front end of the lid so that it may fit over the fuze and rest on the striker retaining pin. Some units are fitted with a safety rod, which prevents the lid from actuating the fuze prematurely. This mine can also be equipped with a mortar grenade.

b. Use. The PMD-6 wooden mine is used in antipersonnel minefields around outposts and gun positions, along trails and road shoulders, and in grassy areas.

c. Functioning. Pressure on the lid forces the winged retaining pin from the striker, which thus released detonates the charge. The mine may be boobytrapped by connecting the eye of the striker retaining-pin by a wire or cord to a stake driven into the ground under it, or by other simple methods.

d. Installing and Arming.

- (1) Lift the lid.
- (2) Place the charge in the box so that the detonator well points toward the front.
- (3) Insert the MUV fuze and Md-2 detonator through the hole in the front of the box and into the charge.
- (4) Turn the striker retaining pin so that the loop is down.
- (5) Close the lid.
- (6) From a distance, pull the safety pin from the mine (only a few units have the safety pin).

e. Disarming.

- (1) Check for and remove all antilift devices.
- (2) Lift the lid.
- (3) Pull out the fuze and detonator assembly.
- (4) Unscrew the detonator from the fuze.

6-62. Mine, Antipersonnel, PMN, Nonmetallic (USSR)

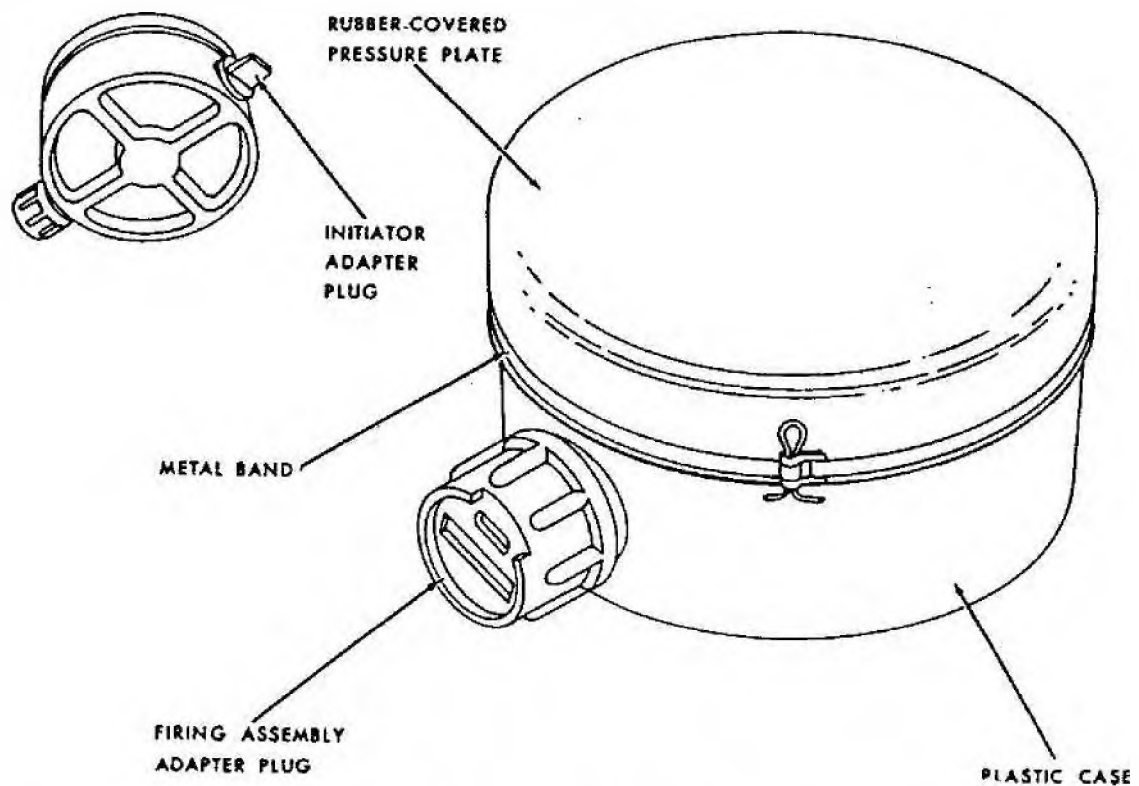


Figure 6-98. Mine Antipersonnel, PMN, Nonmetallic.

Dimensions	Wt	Fuzes	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.5" Height: 2.2"	1.8 lb		0.5 lb approx.	TNT 8.4 oz	Tetryl 0.35 oz

a. *General.* This is a delay-armed, pressure-fired mine. The major external components are a plastic case, a rubber-covered pressure plate, a firing

assembly adapter plug, and an initiator adapter plug.

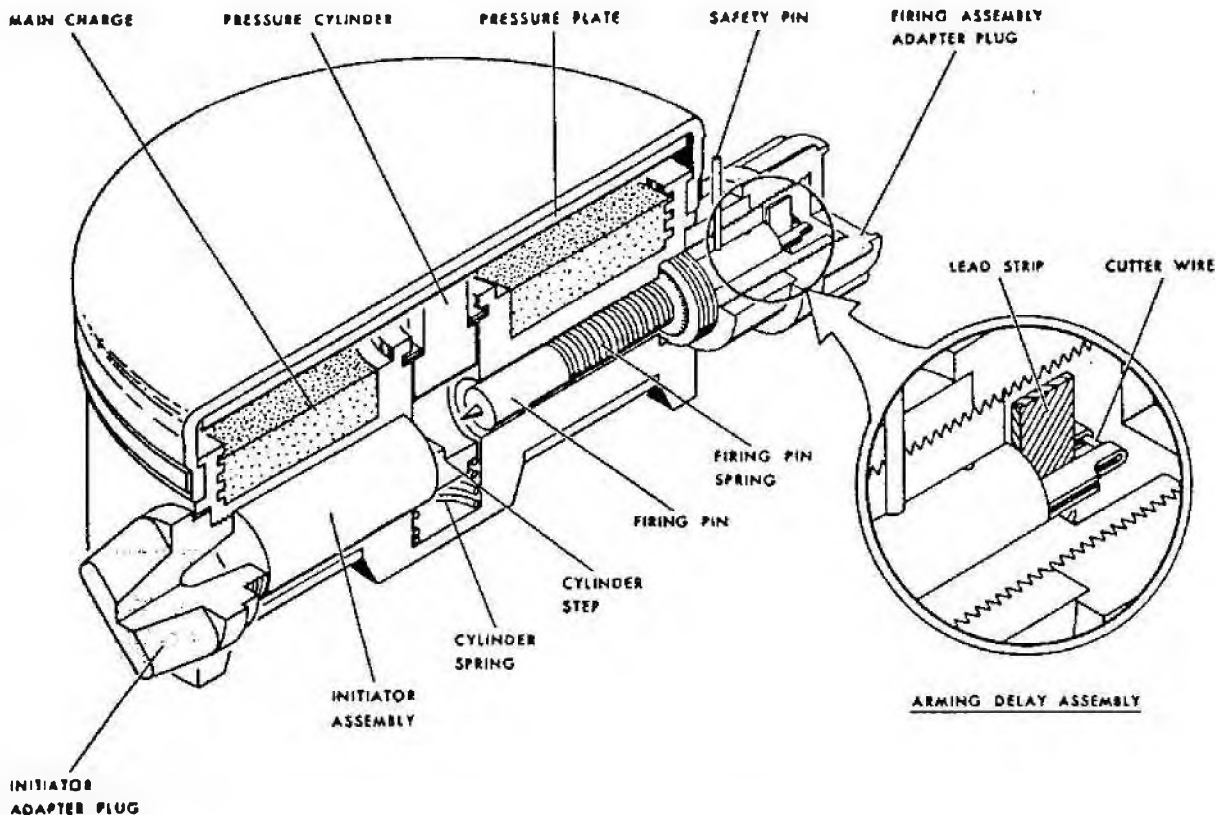


Figure 6-89. Mine, Antipersonnel, PMN, Nonmetallic.

b. Use. The PMN is designed for use against personnel.

c. Functioning. Delay arming. When the safety pin is withdrawn, the firing pin moves forward under pressure of the firing pin spring until a wire in the after end of the firing pin spindle contacts a lead strip in the arming delay assembly. After a delay of approximately 15-20 minutes, the wire cuts through the lead strip, releasing the firing pin to move forward into a cavity of the pressure cylinder, where it is stopped by a step in the cylinder. The firing pin remains in this position until the mine is fired.

Firing. When pressure (approx $\frac{1}{2}$ lb) is applied to the top of the mine, the pressure plate is forced downward against the cylinder, compressing the cylinder spring, and causing the cylinder step to be moved downward in relation to the firing pin. The firing pin spring then forces the firing pin through the cylinder cavity, firing the initiator which, in turn, detonates the main charge.

d. Precautions. The initiator assembly has a booster charge and a percussion-fired primer-detector. The mine contains a cocked firing pin.

6-63. Mine, Antipersonnel, Plastic, Chemical Delay (USSR)

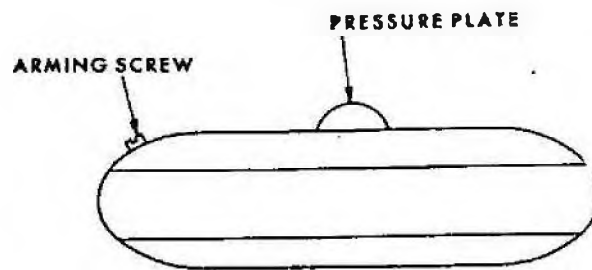


Figure 6-100. Mine, Antipersonnel, Plastic, Chemical Delay.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: 5.8" approx. Height: 3"—4" approx.	No data	Pressure	17.6 lb	TNT 8.75 oz	No data

a. General. This mine has a 10-20 minute chemical delay element. The mine has a plastic case and a pressure plate probably made of rubber.

b. Functioning. Upon removal of the arming screw, an acid is released which drops through an opening in the screw shaft onto a lead safety strip. The acid corrodes the safety strip in 10-20

minutes, after which time the mine will ignite when the pressure plate is stepped on.

c. Installing and Arming.

- (1) Prepare hole about 25 cm deep.
- (2) Remove arming screw.
- (3) Place mine in hole and cover with earth.

6-64. Mine, Antipersonnel, PMN-6 (USSR)

Illustrations furnished for identification.

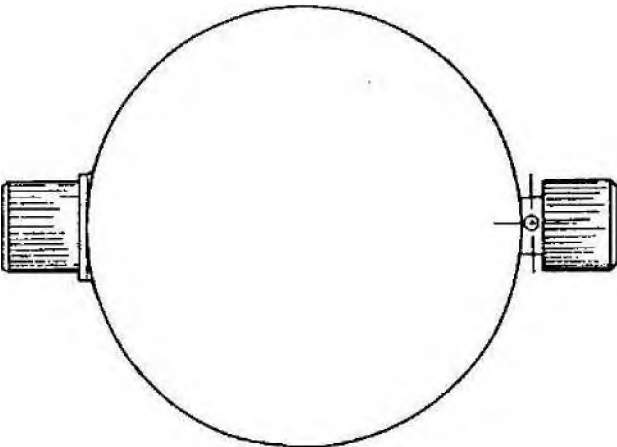


Figure 6-101. Mine, Antipersonnel, PMN-6.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	No data	No data	No data	7 oz TNT	No data

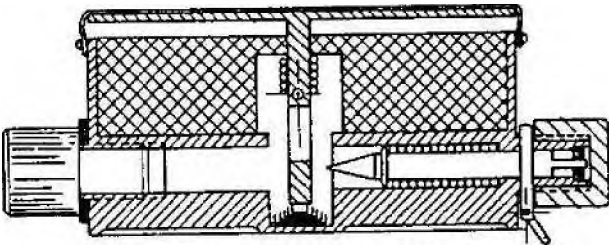


Figure 6-102. Mine, Antipersonnel, PMN-6.

6-65. Mine, Antipersonnel, OZM-3 Bounding (Trip, Fragmentation) (USSR)

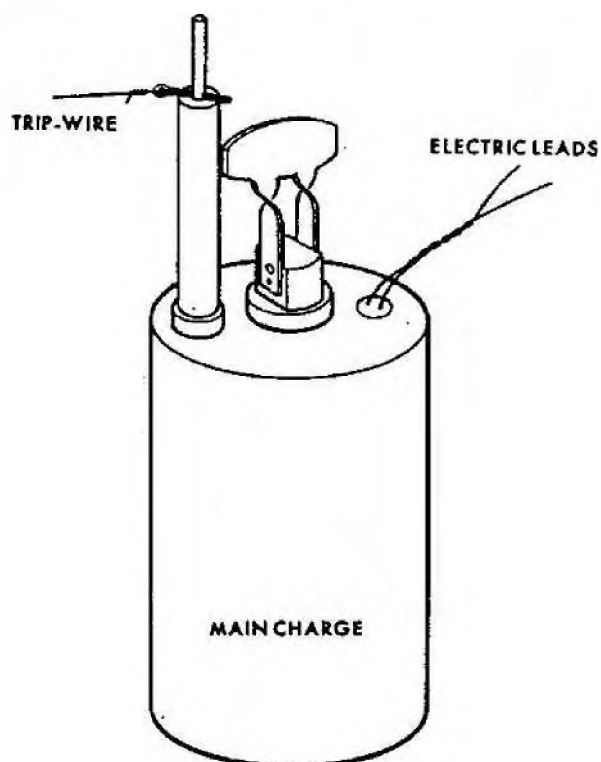
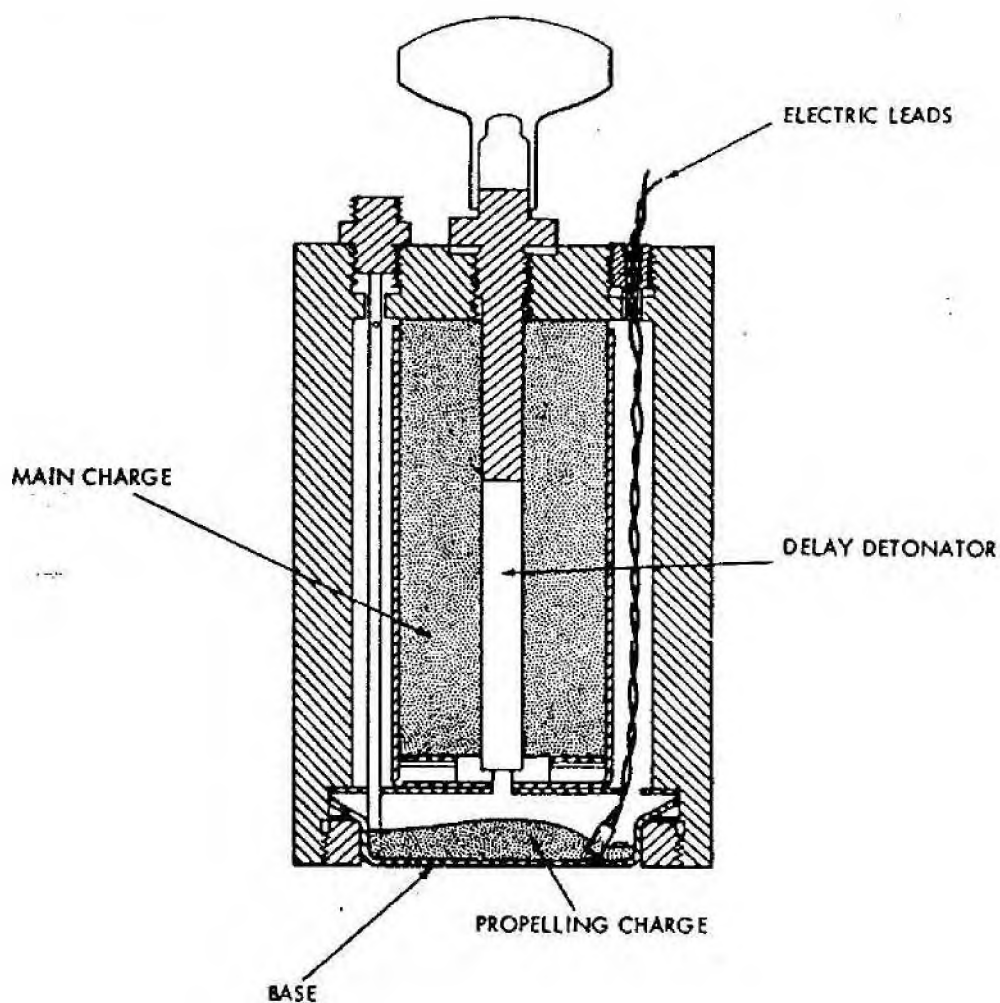


Figure 6-103. Mine, Antipersonnel, OZM-3 Bounding (Trip, Fragmentation).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3" Height: 4.7" approx.	9.9 lb	No data	No data	2.8 oz	No data

General. The mine has 2 fuze wells located in the top. It has an effective radius of 25m and reaches a height of 1.5m at detonation.



SOVIET ANTIPERSONNEL MINE MODEL OZM-3
FOM 2-1345-1-82

Figure 6-104. Mine, Antipersonnel, OZM-3 Bounding (Trip, Fragmentation).

6-66. Mine, Antipersonnel, Wooden, PMD-7 and PMD-7TS (USSR)

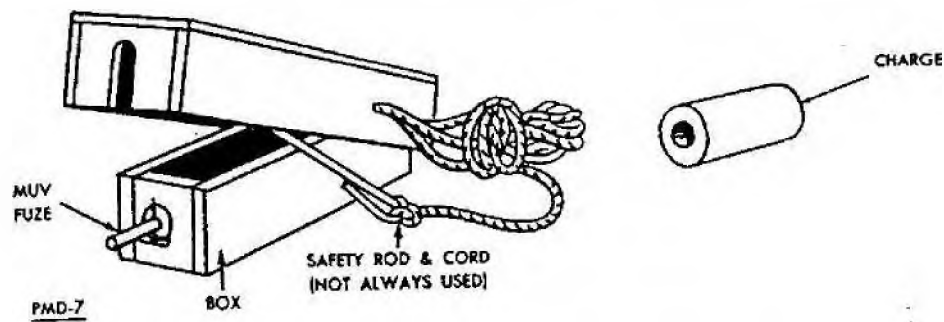


Figure 6-105. Mine, Antipersonnel, Wooden, PMD-7.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 6.2" Width: 2" Height: 2.2"	1 lb	MUV	No data	TNT 0.17 lb	No data

General. The mine has a pressure-operated pin-withdrawal MUV fuze.

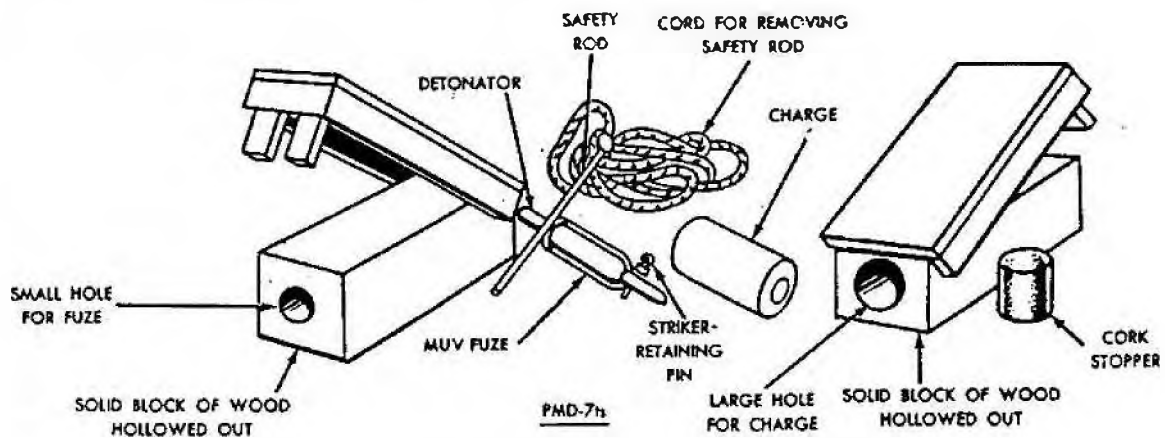


Figure 6-106. Mine, Antipersonnel, Wooden, PMD-7TS.

6-67. Fuze, Pressure-Mechanical, Model MV-5 (USSR)

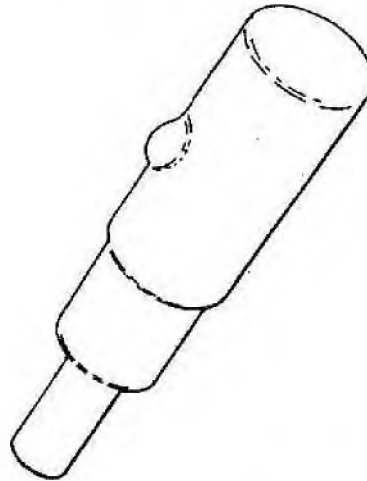


Figure 6-107. Fuze Pressure-Mechanical, Model MV-5.

Dimensions	Case	Internal action	Operating force
Diameter: 0.5" Height: 3.6"	Metal or plastic	Pressure-mechanical, with retaining ball release.	15 lb.

a. General. This is a mechanical action pressure fuze with a spring-loaded striker enclosed in a metal case. (It may also be found with a plastic case.) It has a pressure cap with a bulge or recess to receive the striker retaining ball.

b. Use. The MV-5 pressure fuze is used in the TM-41, TMB-2, TMD-B, and TM-46 antitank mines. In World War II and the Korean War, it was found in many types of improvised mines.

c. Functioning. A pressure of 15 pounds or more on the pressure cap forces it down, compressing the striker spring and releasing the retaining ball, which escapes into the bulge. The spring-driven striker, thus released, hits the percussion cap and in turn sets off the detonator and explodes the mine. (If the mechanism is faulty from deterioration or other causes, the fuze may function at less than 15 pounds pressure.

d. Installing and Arming. Insert the fuze and detonator assembly into the mine. As the fuze has no safety device, the detonator is not attached until the mine is laid and ready for the installation of the fuze.

e. Disarming.

(1) Without applying pressure on the pres-

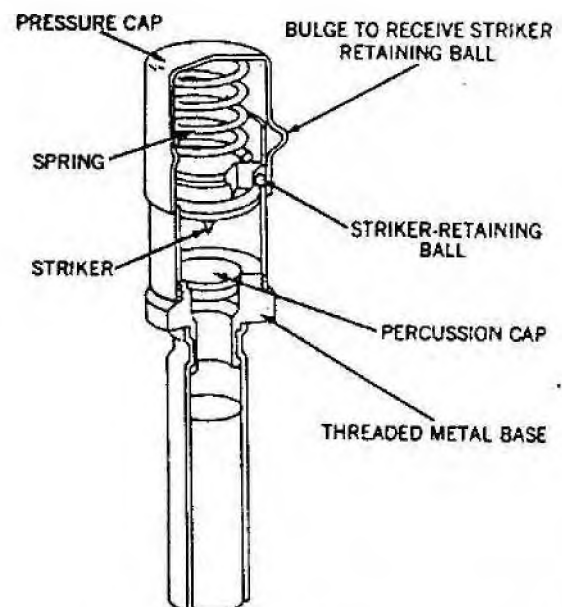


Figure 6-108. Fuze, Pressure-Mechanical, Model MV-5.

sure cap, remove the fuze-detonator assembly from the mine and separate the detonator from the fuze.

(2) Remove the fuze to a safe storage or disposal area.

6-68. Fuze, Pull-Mechanical, Model MUV (USSR)*Figure 6-109. Fuze, Pull-Mechanical, Model MUV.*

Dimensions	Case	Internal action	Operating force
Diameter: 0.5" Height: 3"	Type I: steel tin-plated Type II: plastic Type III: ebonite Type IV: sheet steel	Mechanical pin retained, spring loaded.	2 lb. or more

a. General. This is the most commonly used Soviet pull fuze. It functions at the withdrawal of a winged striker retaining pin by a pull on a trip wire or pressure to meet the requirements of a particular mine. This fuze, also used extensively in boobytraps, is available in four types of cases.

b. Use. This fuze is especially adaptable for detonating the POMZ-2, PMD-6, and other antipersonnel mines and the YaM-5 antitank mine.

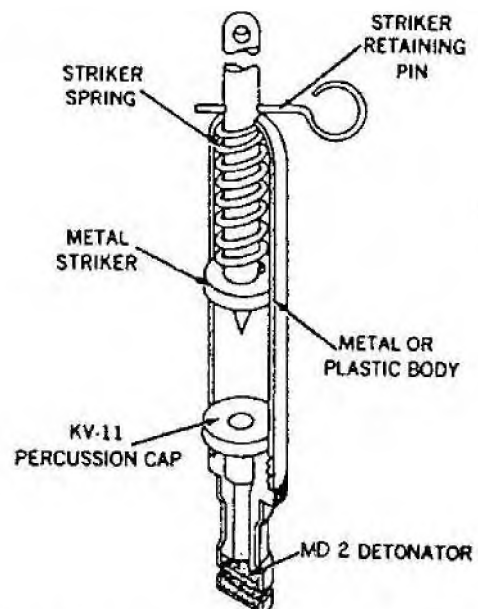
c. Functioning. Force applied on the tripwire removes the retaining pin from the striker, which, powered by the spring, actuates the detonator.

d. Installing and Arming. This fuze is generally fitted with a straight transit pin placed in the outer hole of the striker as a safety measure.

(1) Grasp this pin, pull out the striker revealing the inner hole.

(2) In this inner hole, place a loop-ended or winged retaining pin and then remove the transit pin.

(3) Screw on MD-2 or No. 8 detonator into

*Figure 6-110. Fuze, Pull-Mechanical, Model MUV.*

the base of the fuze and place in the mine or in the charge.

(4) If a trip wire is used, fasten it to an

anchor and then to the loop-ended or winged retaining pin.

e. Disarming.

(1) Cut all loose tripwires attached to the retaining pin.

(2) Remove the fuze from the mine and unscrew the detonator from the fuze.

(3) Remove the fuze to a safe storage or disposal area.

f. Precautions. If this fuze is set for tension release actuation in which the fuze striker is held in cocked position by a tripwire, a retaining pin or a substitute should be inserted before the tripwire is cut.

6-69. Fuze, Pull-Mechanical, Model UPF (USSR)

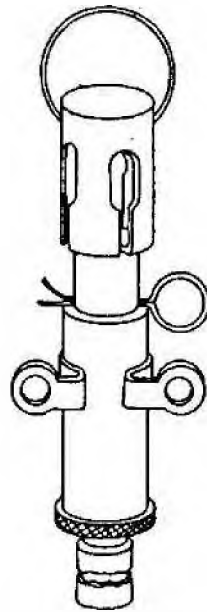


Figure 6-111. Fuze, Pull-Mechanical, Model UPF.

Dimensions	Case	Internal action	Operating force
Diameter: 0.5" Height: 8"	Metal	Pull-mechanical clamp-retained, spring loaded striker.	Lateral pull, 2.5 to 3.5 lb.; axial pull, 8 to 14 lb.

a. *General.* The UPF pull fuze is used widely in the Soviet Army for initiating trip-wire standard and improvised mines of all kinds. It generally functions by a pull on the pull ring; but it also may be fitted with a rod projecting from the clamp top for functioning by lateral pressure or pull. The top of the fuze is, in reality, a clamp that holds the spring driven striker under tension after the safety pin is removed. The fuze is composed of three parts, which are usually assembled only at the place of use.

b. *Use.* This fuze is used in many wooden land mines and boobytraps.

c. *Functioning.* Lateral force or axial pull on the clamp-top pulls the clawlike base from the ball-shaped end of the striker, releasing it.

d. *Installing and Arming.*

(1) Assemble the fuze by forcing the clamp-top onto the ball-shaped end of the striker.

(2) Screw on the detonator assembly.

(3) Insert the assembled fuze-and-detonator into the charge.

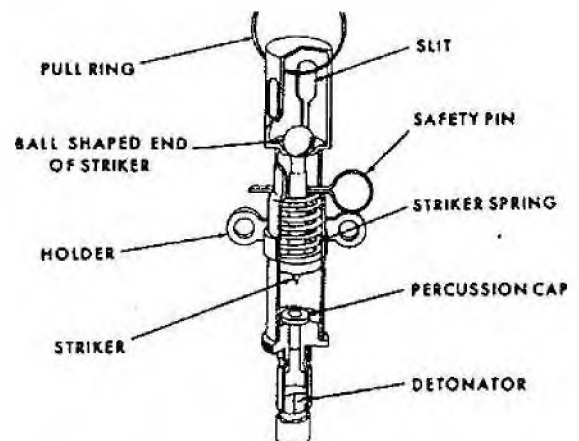


Figure 6-112. Fuze, Pull-Mechanical, Model UPF.

(4) Attach the trip wire to the pull ring.

(5) Remove the safety pin.

e. *Disarming.*

(1) Cut any slack tripwires attached to the fuze (Taut wires must be checked first).

(2) Insert a wire or nail in the safety pin

hole (if this will not go through, the mine should be blown in place).

(3) Pull the fuze from the mine.

(4) Separate it from the detonator.

(5) Remove the fuze to a safe storage or disposal area.

f. Precaution. In most cases mines or charges fitted with this fuze should be detonated in place.

6-70. Fuze, Pressure, MVM (U55R)



Figure 6-113. Fuze, Pressure, MVM.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	No data	No data	No data

a. General. The MVM fuze consists of a cap, diaphragm, safety pin, sleeve, case, spring, striker, ball, and detonator assembly.

b. Use. The MVM fuze is used when transporting the armed antitank mine TM-46 or when this mine is being laid by mine laying equipment.

c. Functioning. When the track of a tank presses on the mine, the pressure cap and fuze sleeve move downward and break through the diaphragm. As soon as the wider part of the case is level with the hole in the sleeve holding the ball, the ball falls out and releases the striker.

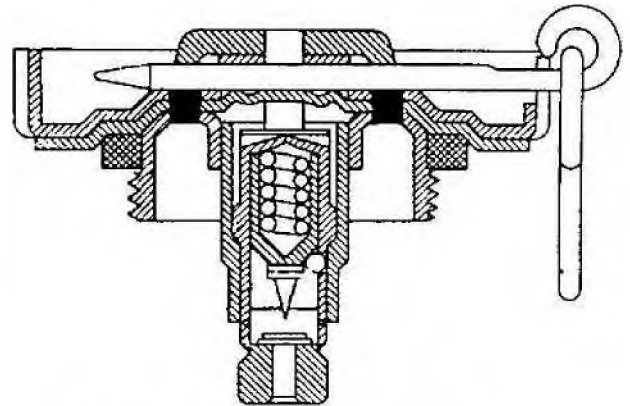


Figure 6-114. Fuze, Pressure, MVM.

6-71. Fuze, Pressure, MV-5-K (U55R)



Figure 6-115. Fuze, Pressure, MV-5-K.

Dimensions	Case	Internal action	Operating force
Diameter: 0.64" Height: 1.25"	Plastic	Mechanical	28 lb approx.

a. General. This fuze is a pressure type, spring-loaded, ball release firing device. The fuze body is a two-piece molded black plastic sleeve and cap containing the firing mechanism. The sleeve is internally threaded to accept the primed coupling base with detonator.

b. Use. This fuze is used with antipersonnel mines.

c. Functioning. The spring-loaded striker of this fuze is retained by a locking ball arrange-

ment. When the outer plastic case is forced down under pressure, the recess for the locking ball is aligned with the ball and allows the ball to move into the recess. This action frees the striker and it is driven into a percussion primer by the compressed spring.

d. Precautions. The fuze has no safety device. Do not screw the detonator assembly into the base of the fuze until you are ready to use the fuze.

6-72. Fuze, Pull, Delayed-Arming, Model MUV-2 (USSR)

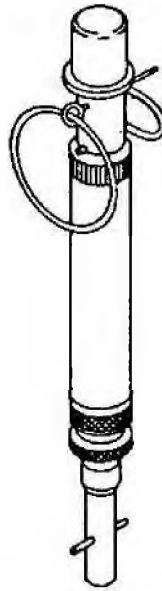


Figure 6-116. Fuze, Pull, Delayed-Arming, Model MUV-2.

Dimensions	Case	Internal action	Operating force
Diameter: 4.8" Height: 0.4"	Metal	Mechanical with soft metal shear arming delay and pin-retained spring-loaded striker.	2 lb. or more

a. General. This is a modified MUV pull fuze with an arming time delay device that gives troops several minutes to lay and camouflage a

mine and reach a safe distance before the fuze becomes fully armed. The end of the striker, which protrudes from the body of the fuze, has a

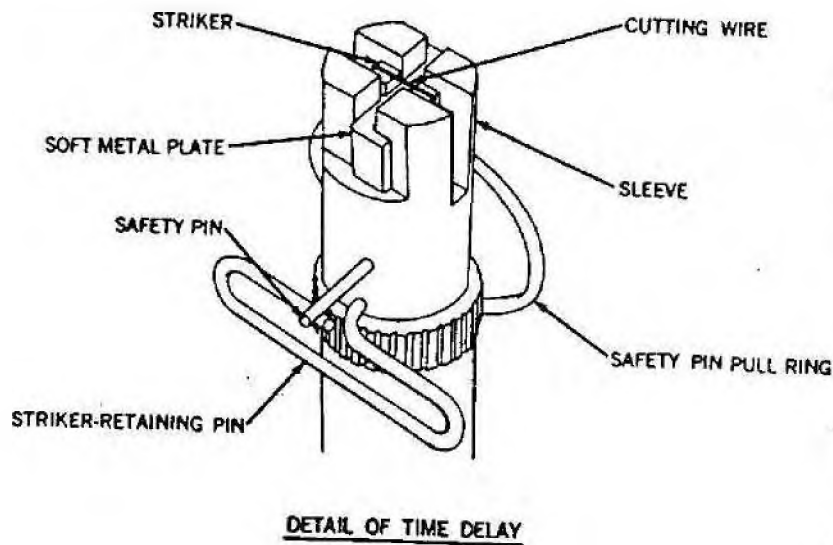


Figure 6-117. Fuze, Pull, Delayed-Arming, Model MUV-2.

deep groove across which is fitted with thin cutting wire. Beneath this wire is a soft metal plate, held in position by a sleeve fitted over the protruding end of the striker. When the safety pin is removed, the wire cuts through the soft metal. The striker is then held only by the retaining pin.

b. *Use.* This fuze is used in the PMD-6M anti-personnel mine.

c. *Functioning.* Force applied on the winged retaining pin removes it from the fuze, releasing the striker to fire the percussion cap.

d. *Installing and Arming.*

- (1) Attach a detonator to the fuze.
- (2) Insert the fuze in the mine.
- (3) Lay the mine.
- (4) Remove the safety pin.

e. *Disarming.*

- (1) Carefully remove the fuze from the mine, holding the striker retaining pin firmly in place.
- (2) Separate the detonator from the fuze.

6-73. Fuze, Pressure, MV-3 (USSR)

Illustration furnished for identification.

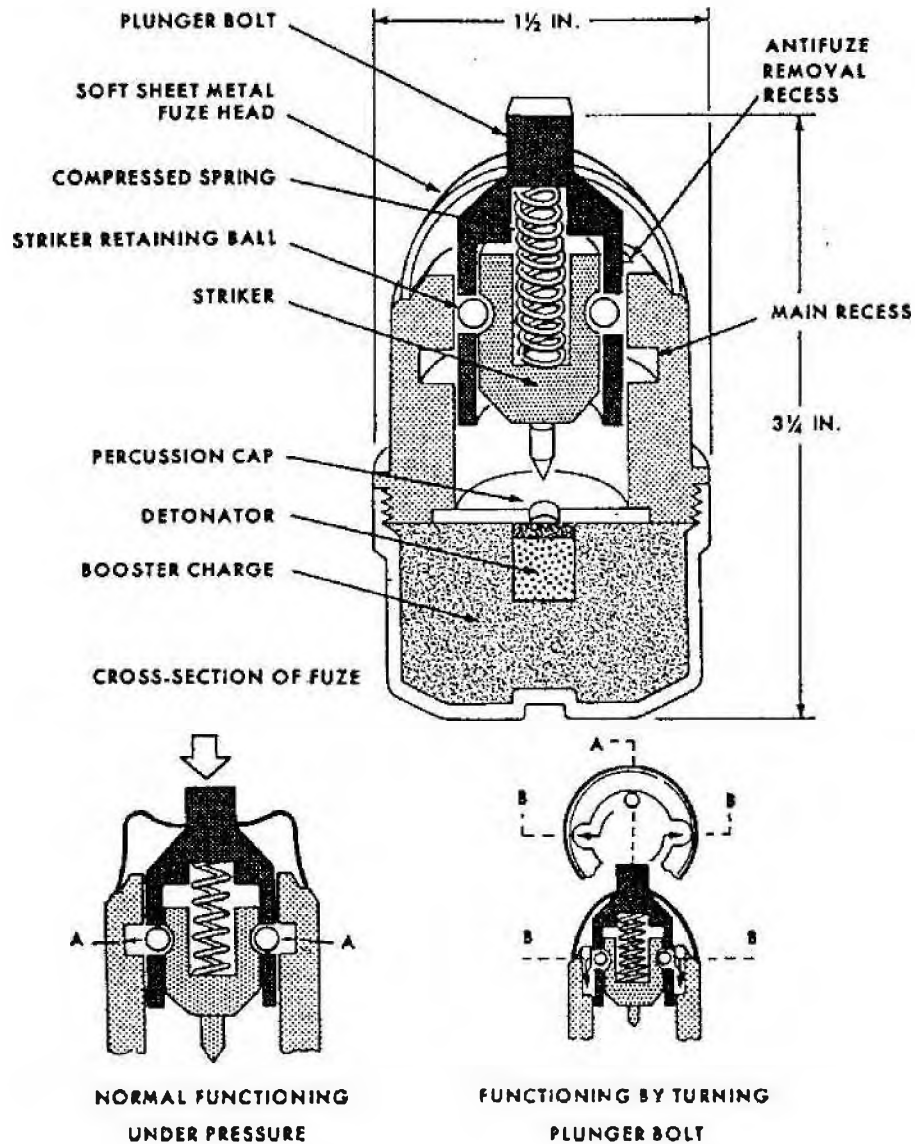


Figure 6-118. Fuze, Pressure, MV-3.

6-74. Mine, Antitank, Metal Pot Mine (Yugoslavia)

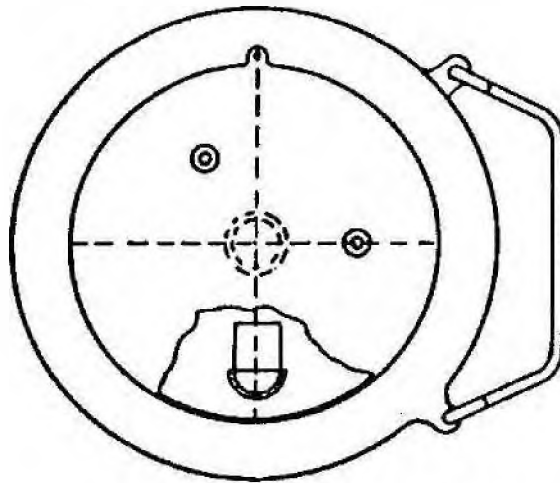


Figure 6-119. Mine, Antitank, Metal Pot Mine.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	No data	Pressure	220 lb	5.5 lb	No data

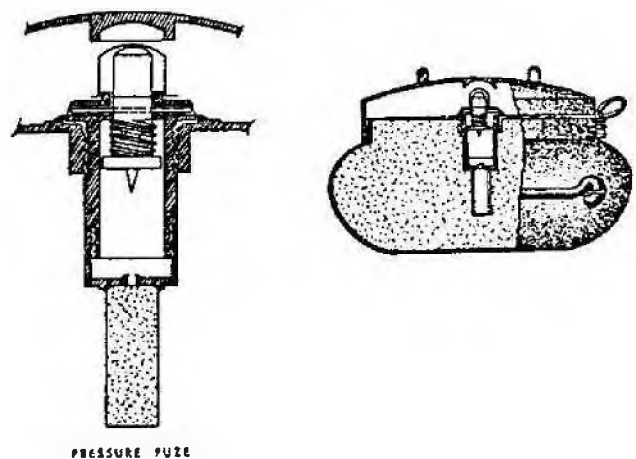
a. *General.* The mine consists of a sheet metal case with curved side walls and a handle. The mine has a central fuze well. A cover pressure plate fits on top of the case.

b. *Functioning.* When a weight is applied to the cover plate, the cover presses on top of the firing pin which has a spring and is held in position by a shear pin. Under the required pressure, the shear pin is sheared and the spring forces the firing pin downward actuating the detonator. Initiation of the detonator fires the primer, which in turn, fires the main charge.

c. *Installing and Arming.*

- (1) Bury the mine to a shallow depth.
- (2) Remove the safety band (or pins).
- (3) Turn the pressure cover until it moves downward and rests on the firing pin.

d. *Disarming.* Turn the pressure cover until it screws up and no longer rests on the firing pin.



PRESSURE FUZE

Figure 6-120. Mine, Antitank, Metal Pot Mine.

6-75. Mine, Antitank, PT 56 (Yugoslavia)

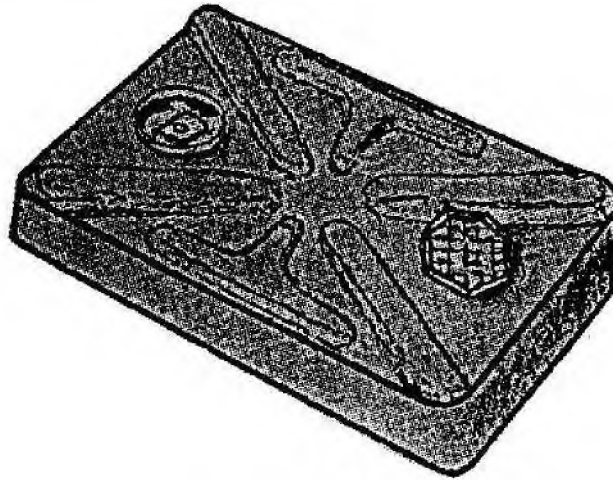


Figure 6-121. Mine, Antitank, PT 56.

Dimensions	Wt	Fuz	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	22 lb	No data	No data	TNT 12 lb approx.	No data

6-76. Mine, Antitank, TMA-1 (Yugoslavia)

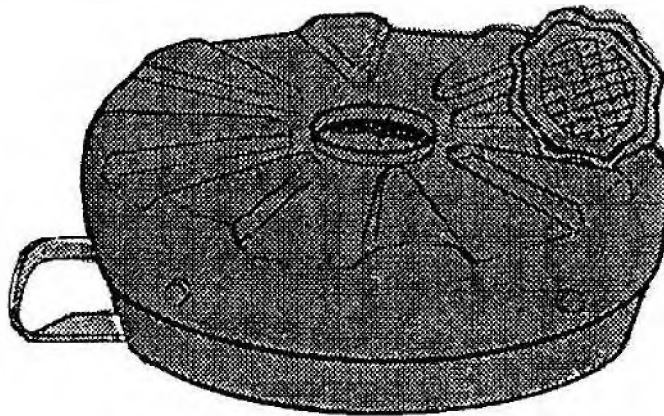


Figure 6-122. Mine, Antitank, TMA-1.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.9" Height: 4.13"		Pressure friction	440-1300 lb adjustable	TNT 12.1 lb	No data

a. General. The mine has a plastic case and has 2 fuze wells—one in top center of pressure plate, the other in the bottom. Along the body circumference, there are 4 openings set crosswise for the insertion of joints, designed to regulate the tread-

ing force. The "UTMAH"—1 plastic fuze is used with the mine.

b. Use. The mine is used against tanks, vehicles, personnel, and in demolitions.

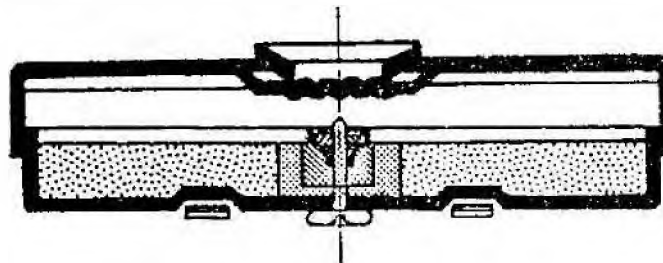


Figure 6-123. Mine, Antitank, TMA-1.

c. Functioning. Required pressures on the top of the mine break the joints and the downward pressure of the top breaks the fuze cap. Breaking the fuze cap causes friction to ignite the incendi-

ary mixture which in turn, ignites the No. 8 detonator. The detonator, in turn, ignites the initiating primer and the main explosive charge.

6-77. Mine, Antitank, TMA-3 Nonmetallic (Yugoslavia)

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: 10.1" Height: 9.1"	14.8 lb	Pressure	395-705 lb	TNT	No data

a. General. This plastic blast-resistant mine has 4 fuze wells; 3 at the top, 1 on the bottom. The mine is airtight and water resistant. All components of the mine are nonmetallic.

b. Use. The mine is used to destroy armored vehicles and other vehicles. The mine is suitable for nuclear warfare, being resistant to blast overpressure from the explosion of nuclear bombs.

6-78. Mine, Antipersonnel, Bounding, Fragmentation Flare, PMRS (Yugoslavia)



Figure 6-124. Mine, Antipersonnel, Bounding, Fragmentation Flare, PMRS.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	No data	Pull	6-37 lb	Cast TNT 7 oz	No data

a. General. The mine has a serrated case made of steel. In the bottom of the case, there is an opening for insertion of the charge and a stake for setting the mine. The bottom of the case has 2 holes for drainage if water has entered the mine due to its location. Fragmentation has an effective range of 200 meters.

b. Use. Mine is used against foot troops, with the flare signaling their presence and illuminating the terrain. As a rule, the flare is not set in a minefield system.

c. Functioning. A double-ended safety element holds a small firing pin inside a large one by means of a spring. By pulling an attached wire, the double-ended safety element is extracted releasing first the small and then the large firing pin. Upon release, the small firing pin strikes the initiating primer of the flare cartridge, actuating it. Then, the large firing pin is released, striking the initiating primer which ignites the detonator and, in turn, the explosive charge.

6-79. Mine, Antipersonnel, PP 56 (Yugoslavia)

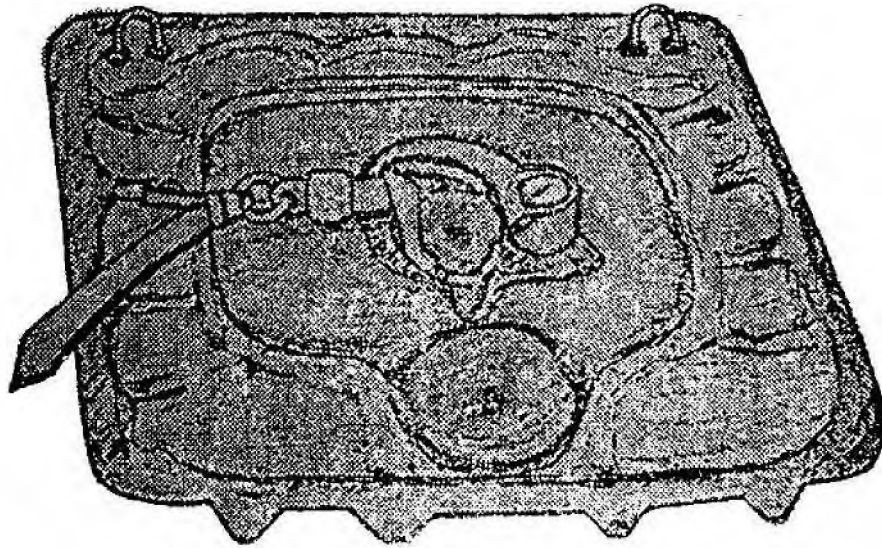


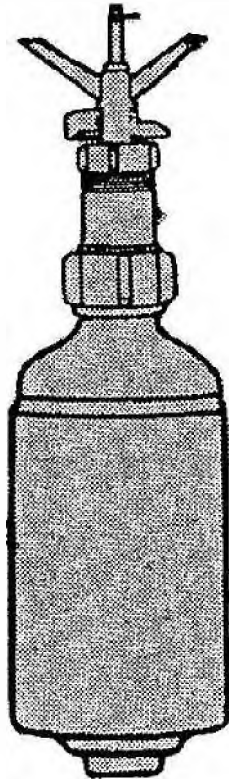
Figure 6-79. Mine, Antipersonnel, PP 56.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	8.8 lb	No data	1.17 lb	TNT 7 oz approx	No data

General. This mine has a square plastic case.

6-80. Mine, Antipersonnel, Prom-1 Bounding (Yugoslavia)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3" Height: w/o fuze 7.1" w/fuze 10.4"	5.9 lb	Pressure or Pull Release.	13-20 lb.	Cast TNT 0.9 lb	N/A



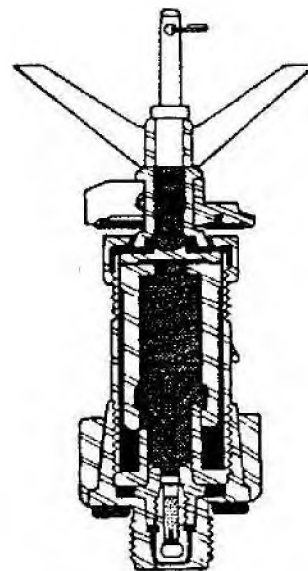
a. *General.* This is a fragmentation, bounding type mine.

b. *Use.* This mine is used against foot troops.

c. *Functioning. Bounding action.* The required pressure pushes the cylinder down, freeing the retaining balls which allows the striker to hit the percussion cap. The percussion cap explodes igniting, in turn, the bounding charge which ejects the mine 0.7 to 1.5 meters above the ground surface.

Shrapnel effect. At 0.7 to 1.5 meters above the ground, the main charge explodes and causes fragmentation which is lethal at 25 meters distance and dangerous within a radius of 100 meters.

Figure 6-126. Mine, Antipersonnel, Prom-1 Bounding.



FUZE PRESSURE OR PULL-RELEASE

Figure 6-127. Mine, Antipersonnel, Prom-1 Bounding.

6-81. Mine, Antipersonnel, P-PMA-1 Nonmetallic (Yugoslavia)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 6" Width: 2.6" Height: 1.3"	9.8 oz	Pressure chem	6-37 lb	TNT 7 oz	N/A

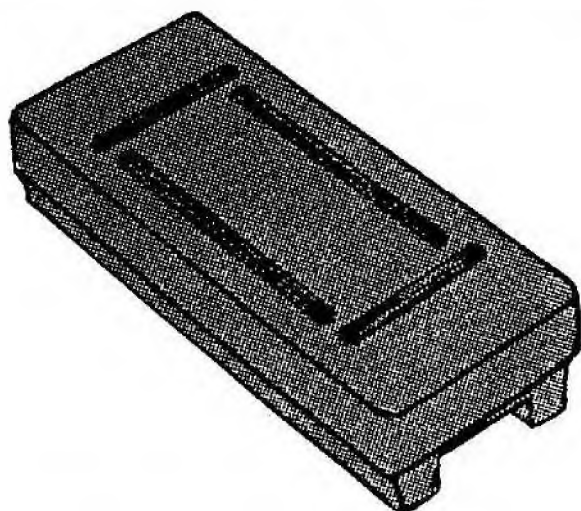


Figure 6-128. Mine, Antipersonnel, P-PMA-1 Nonmetallic.

a. General. The mine case consists of a plastic box with a plastic hinged cover. The case contains a fuze, detonator, and explosive charge. The bottom of the case has 2 holes for draining the mine prior to removal if laid in wet terrain. (Wet terrain must be drained prior to actual removal operations.)

b. Functioning. Required pressure on the lid, causes the projection on the lid to crush the capsule, igniting the contents, which, in turn, actuate the detonator (No. 8). The detonator initiates the explosive charge.

c. Installing and Arming.

- (1) Place the TNT block in the case.
- (2) Insert the fuze into the block.
- (3) Lower the lid.
- (4) Dig hole and bury or place on surface of ground as desired.

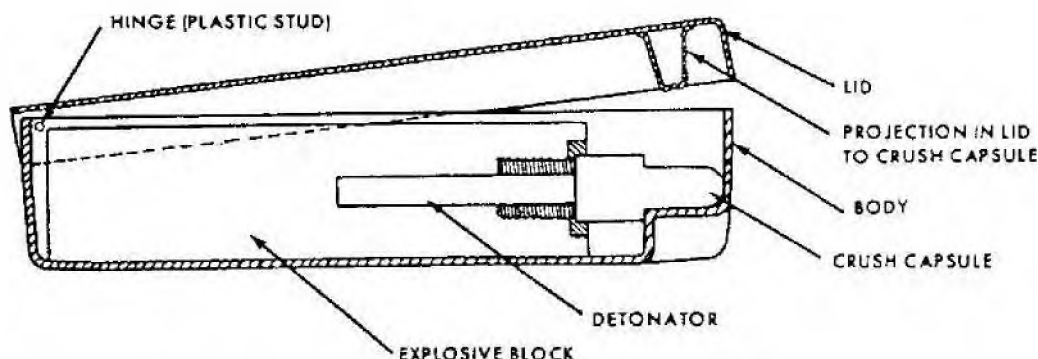


Figure 6-129. Mine, Antipersonnel, P-PMA-1 Nonmetallic.

6-82. Mine, Antipersonnel, Ricochet, Expanding (Yugoslavia)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: no data Height:	No data	Aluminum	13-20 lb	Trinitrotoluol 7oz	0.10 oz

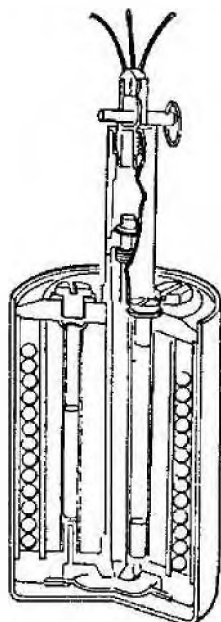


Figure 6-150. Mine, Antipersonnel, Ricochet, Expanding.

a. General. Principal components are casing, internal cylinder, detonators, and fuzes.

b. Functioning. Required pressure forces internal cylinder down, releasing steel balls and allowing the striker to hit the percussion cap and ignite the propellant charge. The mine cylinder is propelled upward from 0.7 to 1.5 meters and then explodes in shrapnel dangerous to a radius of 100 meters and lethal at 25 meters.

c. Installing and Arming.

- (1) Place mine in ground, with mine axis at a right angle to the slope of the ground.
- (2) Unscrew metal cap and remove protective cap of the fuze.
- (3) Screw fuze in mine.
- (4) Unscrew detonator well covers and insert 8 detonators.
- (5) Replace detonator well covers.
- (6) Remove safety screws or pull pin.

d. Disarming.

- (1) Insert safety pin (nail).
- (2) Remove fuze.
- (3) Replace protective cap.
- (4) Remove mine from ground.
- (5) Remove detonators.

6-83. Fuze, Pressure, Nonmetallic (Yugoslavia)

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	No data	No data	396-705 lb.

a. General. This is a blast-resistant fuze. It resists a 20 KT nuclear blast.

b. Use. The fuze is used with mine. Antitank.
TMA-3

6-84. Fuze, Vibration (Yugoslavia)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 1.2" Length: 1.6—2"	No data		No data	No data	

a. General. The vibration detector is inclosed in a small plastic cylinder. The internal components are not known but probably are a heavy mass (inertial) coupled to an electric transducer. The amplifier and the relay are contained in a small plastic box.

b. Use. The sensitivity of the fuze depends on the type of terrain in which it is buried. When placed on the floor of a room, it allegedly records footsteps 10 meters distant. It is used with a proximity type mine.

c. Functioning. The vibrations in the ground

are picked up by a seismic detector which transmits the signal to a small transistor amplifier. The amplifier is connected to a relay, which actuates the detonator charge.

d. Installing and Arming.

(1) Raise the safety catch.

(2) Pull steel wire to start timing train. (The timing train is about 2 minutes duration and allows the user to move to a safe distance.)

(3) After about 2 minutes, the vibration detector is automatically armed.

CHAPTER 7

MINEFIELD LAYING, DETECTION, AND BREACHING EQUIPMENT OF EURASIAN COMMUNIST COUNTRIES

Section I. SOVIET MINE LAYING EQUIPMENT

7-1. PMR-3 Mine Planter

a. This is a trailer-mounted piece of equipment (fig. 7-1) capable of planting mines at a spacing of 4- or 5.5-meter distance. This mechanical mine

planter is also used by other Eurasian Communist countries under the Soviet sphere of influence. The working components of the PMR-3 are—

(1) the conveyor system which passes the

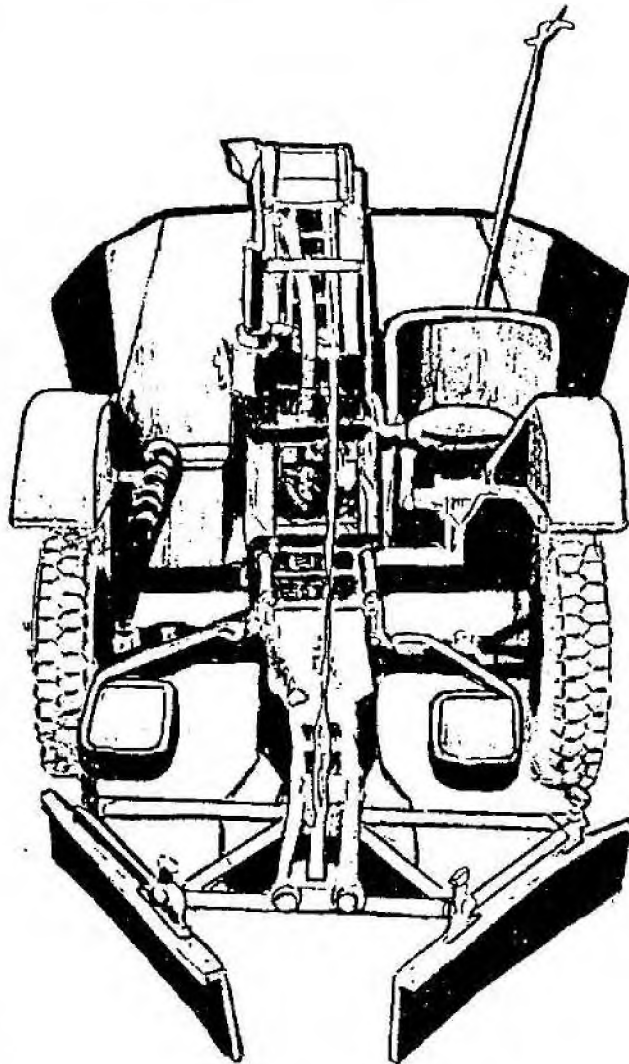


Figure 7-1. Soviet PMR-3 trailer mine layer.

mines from the towing vehicle to the distributor regulator.

(2) The mine distributor regulator which has a two position setting and controls the spacing of the mines at either a 4- or 5.5-meter distance.

(3) the plow which opens the ground to accommodate the mines.

(4) the backfill plates which cover the mines.

b. A modified personnel carrier is used to tow the mine planter. One hundred and twenty TM-46 antitank mines are carried in the cargo compartment of the vehicle in movable racks. A fully loaded vehicle—120 mines—pulling the planter, set at a 4-meter mine spacing, will lay a mine belt one-half kilometer in length. When the towing vehicle is emptied, it is disconnected from the planter and a loaded one attached.

7-2. Modified PMR-3 Mine Planter

East Germany has modified the Soviet PMR-3 to plant antipersonnel mines and redesignated it MLG-60.

7-3. Full-Track Armored Mine Layer (Modified PMR-3)

The full-tracked armored mine layer consists of a PMR-3 mine planter adapted to a modified Ganef missile carrier. In order to adapt the PMR-3 to this chassis, the height of the vehicle was increased by an estimated 18-24 inches. The height increase provides space for mine storage and ad-

ditional operative space for the mine planter crew. This planter affords crew protection from shrapnel and small arms and can be operated in closer proximity to the front.

7-4. Chutes

Chutes (fig. 7-3) have been mounted on a cargo truck or side of a helicopter and trailed on the ground. Mines are placed on the chutes at intervals and slide down to the ground surface where they are armed and camouflaged by personnel. If a double chute is used on a vehicle, a squad can lay 200 antitank mines in 15-20 minutes.

7-5. Use of Helicopter for Mine Laying

Figure 7-4 shows Soviet helicopter rigged for aerial laying of mines.

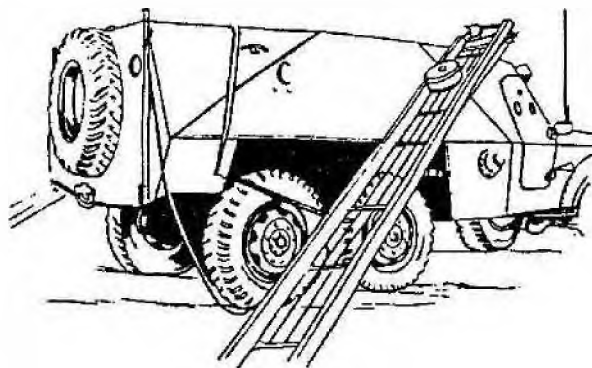


Figure 7-2. Soviet tracked mine layer (modified PMR-3).

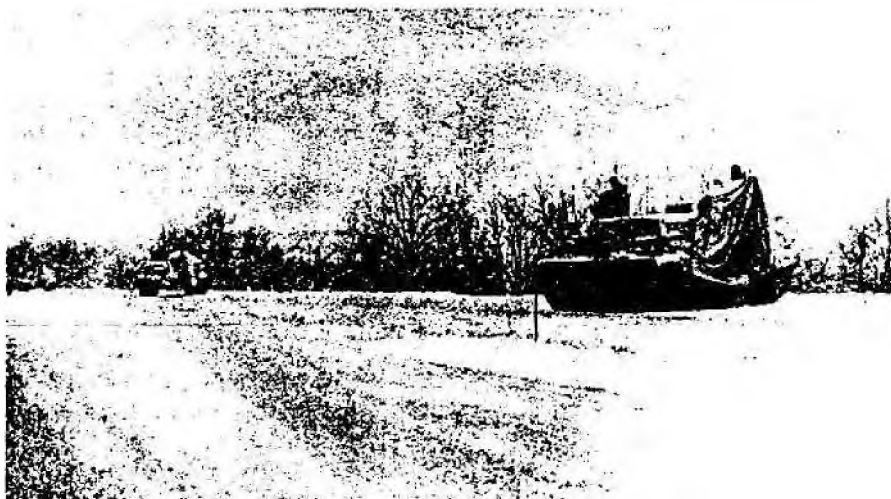


Figure 7-3. Soviet mine laying chutes for vehicle.



Figure 7-4. Soviet helicopter rigged for mine laying.

7-6. Use of Ground Vehicles to Lay Mine Fields

a. This fast method of laying a hasty mine field is particularly important when the enemy is deep

within friendly lines and time is of the essence. The mines may be laid in 3 or 4 rows. When a 3-row antitank mine field is to be laid (fig. 7-5), each member of the squad is given a number and an assigned task. For instance, number 1 remains in the vehicle, takes the mines out of the container and places them at the rear (open end) of the vehicle. Number 2 man follows behind the vehicle, takes the mines from the vehicle and places them on the ground 2 or 3 paces apart from each other. Numbers 3 and 4, on command from the squad leader, carries the mines to the outside rows and numbers 5 and 6 fuze the mines. The squad leader guides the actions of every member and arms the mines in the middle row.

b. If a chute is used it is attached to the back end of the vehicle. Numbers 1 and 2 remain in the vehicle and take turns sliding the mines down the chute in such a way that the mines are dropped at predetermined distances. The remaining personnel carry the mines to their respective rows and arm them. (See fig. 7-6 for illustration of chute.)

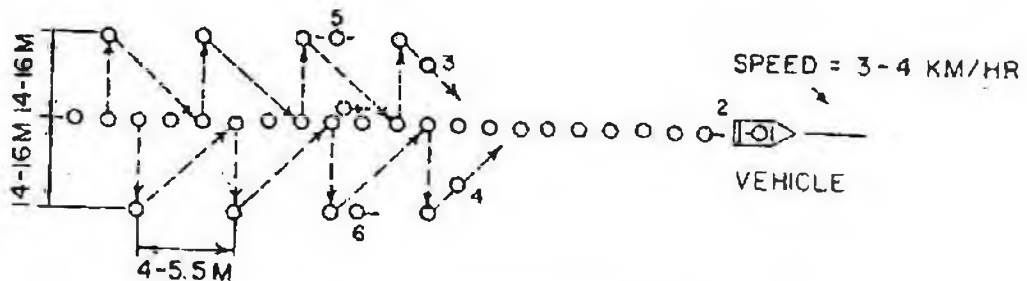


Figure 7-5. Soviet three-row minefield laying.

HOOKS FOR ATTACHING THE CHUTE TO THE VEHICLE (out of bar iron)

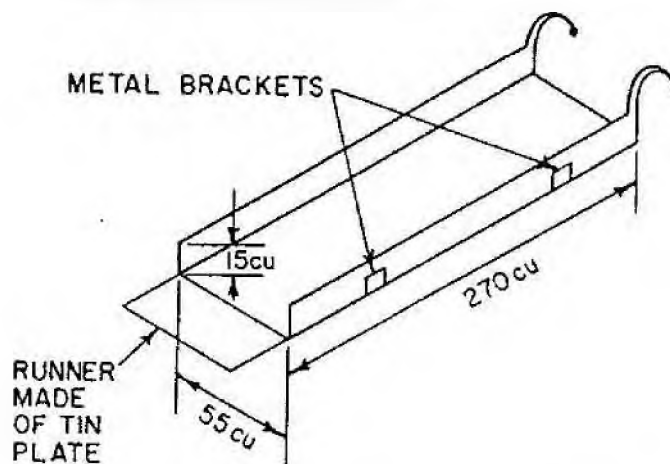


Figure 7-6. Soviet mine laying chute for rear of truck.

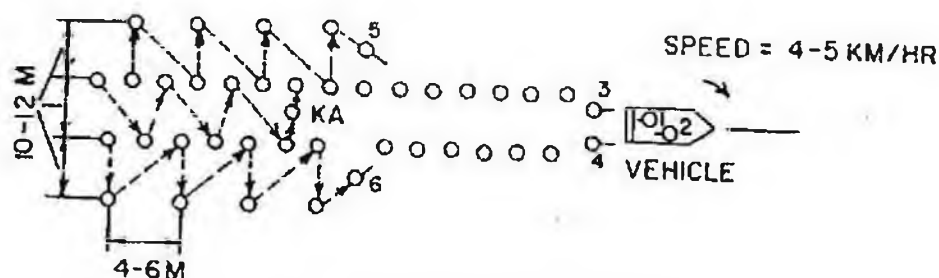


Figure 7-7. Soviet four-row minefield laying.

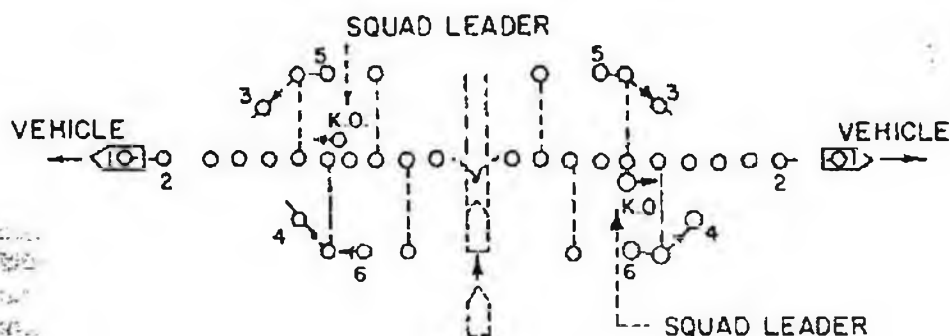


Figure 7-8. Soviet two-team minefield laying.

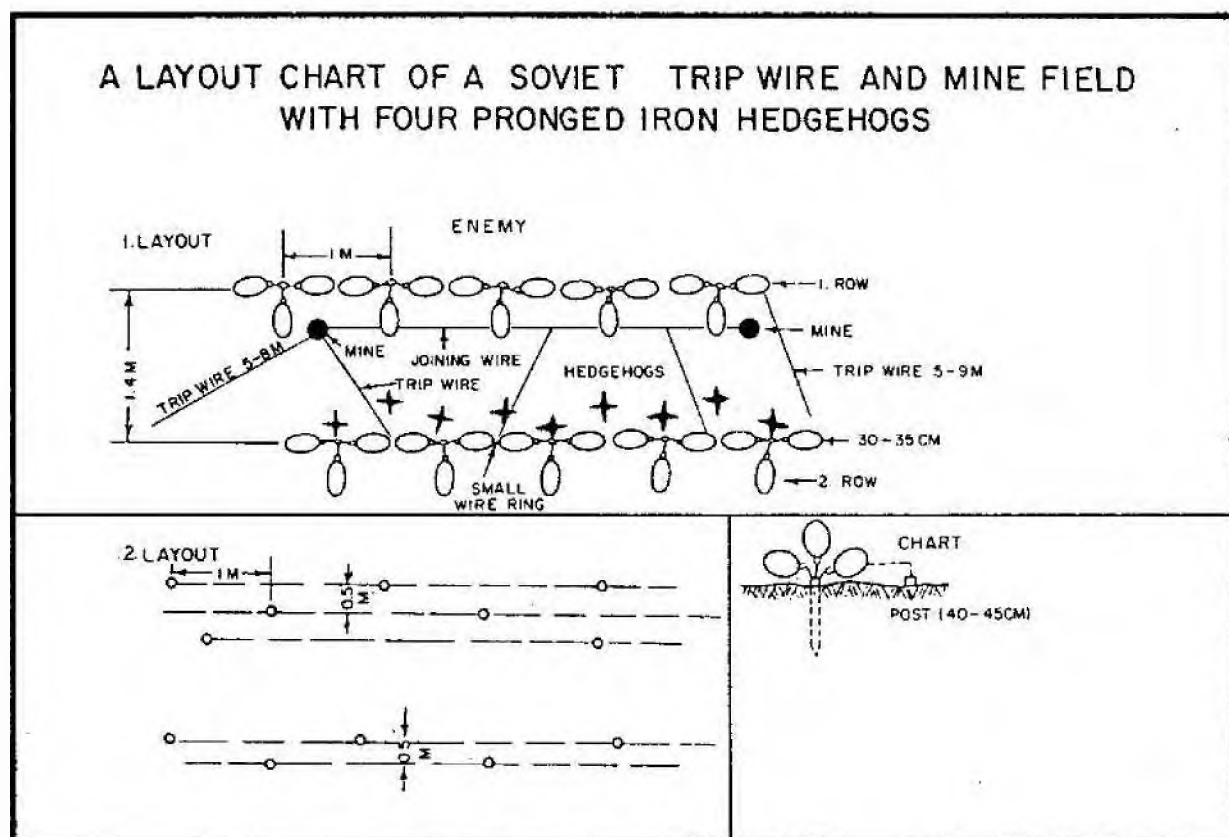


Figure 7-9. Soviet trip wire and minefield with hedgehogs.

c. When laying a 4-row minefield, numbers 1 and 2 place the mines at the rear (open end) of the vehicle. Numbers 3 and 4 take the mines and

carry them 4-5 meters to each side of the path of the vehicle where they are placed on the ground. Numbers 4 and 5, coming from behind on the left

and the right, carry the mines another 10-12 meters and there they are armed. Number 7 (or the squad leader) arms the mines placed along the inside rows. When 2 chutes are used, numbers 1 and 2 take the mines out of their containers and each lays his own row as illustrated in figure 7-7. The remaining members of the team pick up the mines, carry them to a predetermined place, and arm them.

d. If conditions permit, the mines are buried and camouflaged. In this case two more men are needed. If a platoon is used to lay the minefield, one squad is used to reconnoiter the area, mark the minefield boundaries, and lay out the reference lines. The two remaining squads (fig. 7-8) lay the mines in their assigned areas. With the use of a vehicle, a squad can lay, bury, and camouflage 200 antitank mines in 15-20 minutes.

7-7. Trip Wire and Antipersonnel Mine Layout (fig. 7-9)

- Low obstacles are very hard to find, especially in the dark. These make ideal trip obstacles.
- As the victim trips over the first row of ob-

stacles, the attacker drops into the hedgehog which is placed approximately 1.20 to 1.40 meters behind the first row of obstacles.

c. The mines, which are placed in between the trip wire obstacles, will be set off as the victim trips on one of these wires. The second row of trip wires also acts as a trip obstacle, and will set these mines off, since they are attached to the second row of trip wires.

d. These mines can also be set off from a ditch, thus destroying an enemy who is very careful in picking his way through the wire entanglement.

7-8. Soviet Mine Spacing Cord

a. *Physical Features.* This device (fig. 7-10) consists of a main cord with branch lines to which metal rings are attached. The rings indicate the spot for the emplacement of a mine. The main cord, with markers at the end to control lateral shifting, has no standard length (it may be 20 meters or more); and the lengths of the branch cord and the distances between them may vary. This device is a means of quick and accurate spacing that may follow a straight line or change direction several times within its length. All

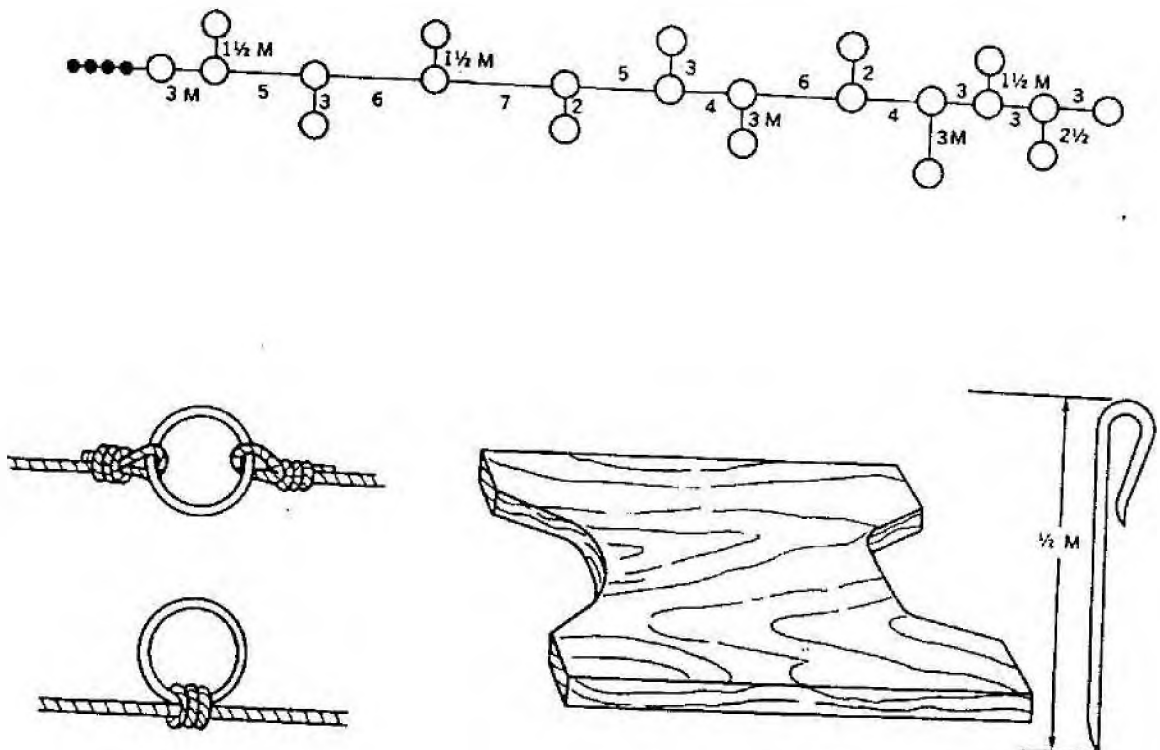


Figure 7-10. Soviet mine spacing cord.

changes in direction are indicated on the minefield record.

b. *Employment.* In minelaying, the cord is laid out to the right, beginning at the forward end of the left boundary line. It is then stretched and pinned down at both ends with metal pins or wooden stakes. Mines are placed at the rings tied

to the ends of the short cords, which are laid out at right angles to the main cord. After the first row has been laid, the device is shifted laterally for the second row, thus staggering in depth the mines within the panel. This procedure is repeated until the required number of rows is laid. The location of these mines is posted on the field record card.

Section II. SOVIET MINE DETECTION EQUIPMENT

7-9. Method

Detection of mines to enable proper clearance procedures is probably the major obstacle in countering the effectiveness of mines. Soviet soldiers are taught to visually detect the presence of mines, to probe suspected areas, and to use electronic mine detectors when mines are suspected or encountered.

7-10. U.S. Influence

Electronic mine detectors were introduced in the Soviet Army during World War II. The United States, through aid to the Soviet Union equipped them with the standard U.S. detector, the SCR-625. The Soviets have improved the principle incorporated in this equipment through research programs and currently possess detection equipment equivalent to other major powers.

7-11. Types

Although the Soviets employ both portable and vehicle-mounted electronic mine detectors in barrier breaching and removal operations, they lack a reliable nonmetallic mine detector, a detector capable of reliably detecting bulk explosives, and

a detector that can distinguish the type of mine being detected.

7-12. The IMP Detector

This is a portable metallic mine detector (fig. 7-11). It has a tubular search head containing one transmitting and two receiving coils housed inside a plastic tube. A four-section search handle, that may be connected together to obtain the desired length, is provided. The electronic components are fully transistorized and mounted on a frame which slides into a waterproof metal case. Power to operate the detector is furnished by four dry-cell flashlight batteries. Two tuning controls are mounted on the detector. When properly tuned, no sound is heard in the headset until the search coils are passed over a metallic object; then a tone is audible. The detector is effective in the detection of metallic mines buried to a depth of 12 to 18 inches. A disadvantage of the detector is that it must be tuned frequently.

7-13. Search Spade Detector Set

This detector set (fig. 7-12) has a perforated aluminum search head shaped like a spade and is

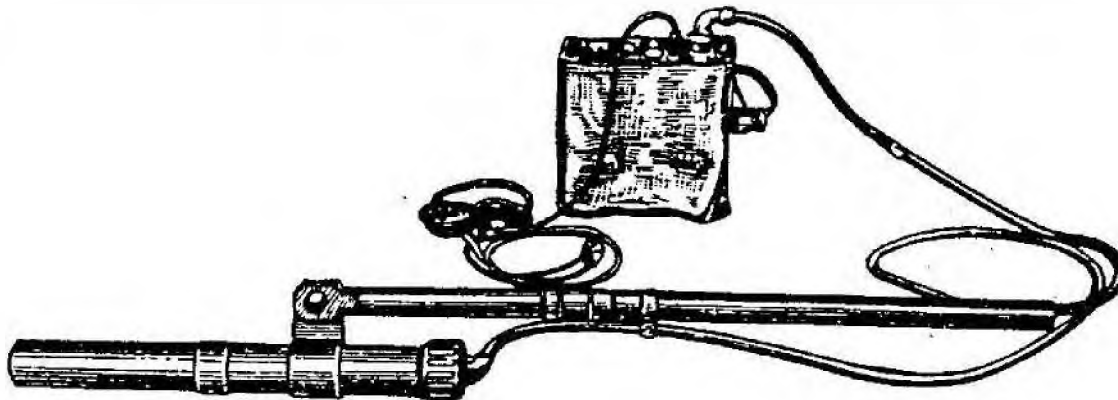


Figure 7-11. Soviet IMP detector.

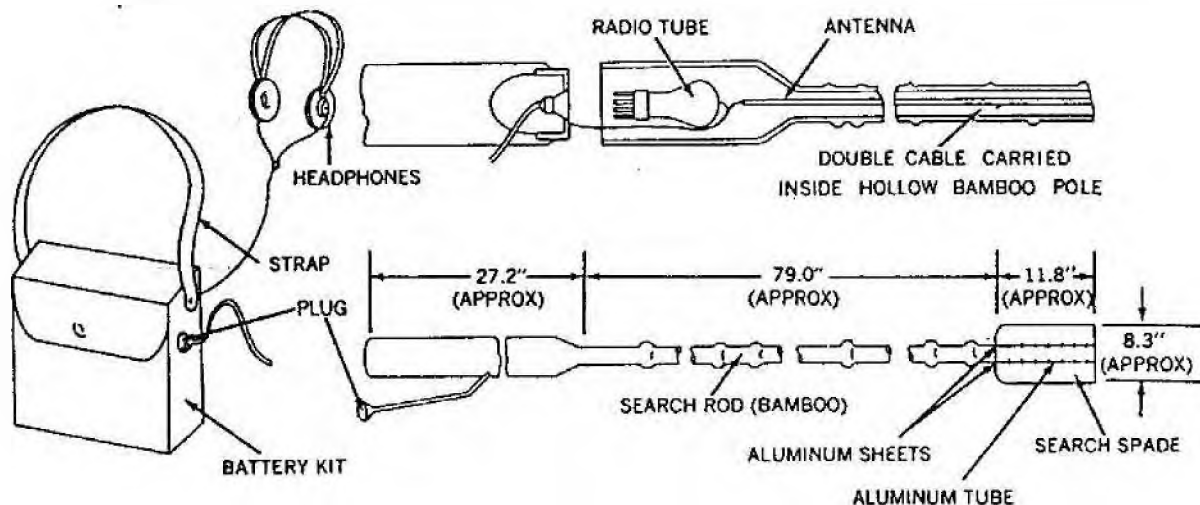


Figure 7-12. Soviet search spade detector set.

powered by a 90-volt dry-cell battery and a 6-volt wet-cell battery. The Soviets claim this detector is capable of indicating the presence of buried metallic objects to a depth of 9 feet. The principle of operation of this item and technical characteristics relative to its electronic components are unknown.

7-14. Vehicle-Mounted Mine Detector

The standard vehicle-mounted mine detector (fig. 7-13) also used by the East European Communist countries operates on the magnetic induction principle and is mounted on the Soviet GAZ-69 jeep. This item is normally carried in a raised position and lowered to the search position on level terrain when used for the detection of large metallic objects buried at an estimated depth of 6 to 8 inches. When objects are detected, an automated braking system stops the vehicle. Provisions for lateral movement of the search coils are incorporated in the system so that the detector operator can pinpoint the exact location of the detected mine. This vehicle detector system is not equipped with remote control equipment.

7-15. Mine Detector Model VIM, 203M

a. *Types.* Two versions of this portable detector have been produced. One has a circular search coil or search head (described here, fig. 7-14); the other is rectangular. Both magnetic induction type detectors are battery powered, will operate continuously for 30 hours, and can detect metallic

mines to an approximate depth of 3.1 to 4.6 centimeters with a detection range of 20.3 to 30.4 centimeters. The approximate weight of each item is 26.4 lb including search head of 14.5 lb.

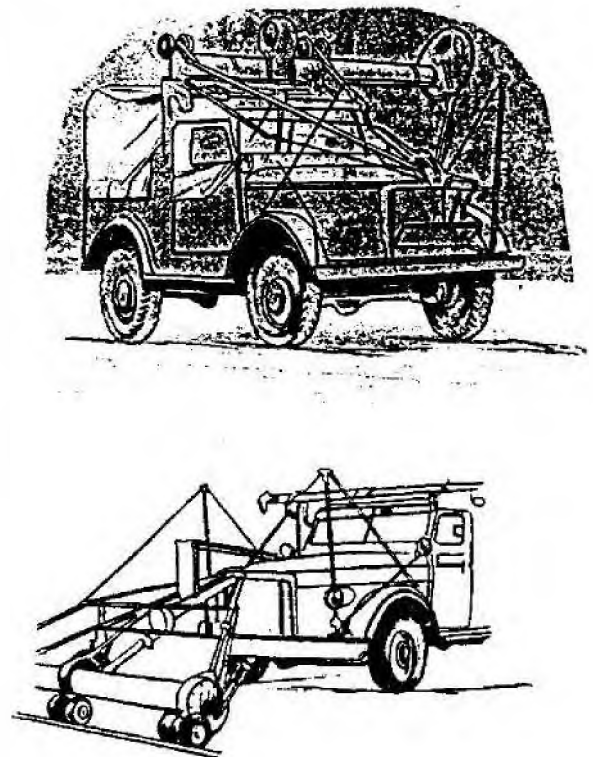


Figure 7-13. Soviet vehicle-mounted mine detector.

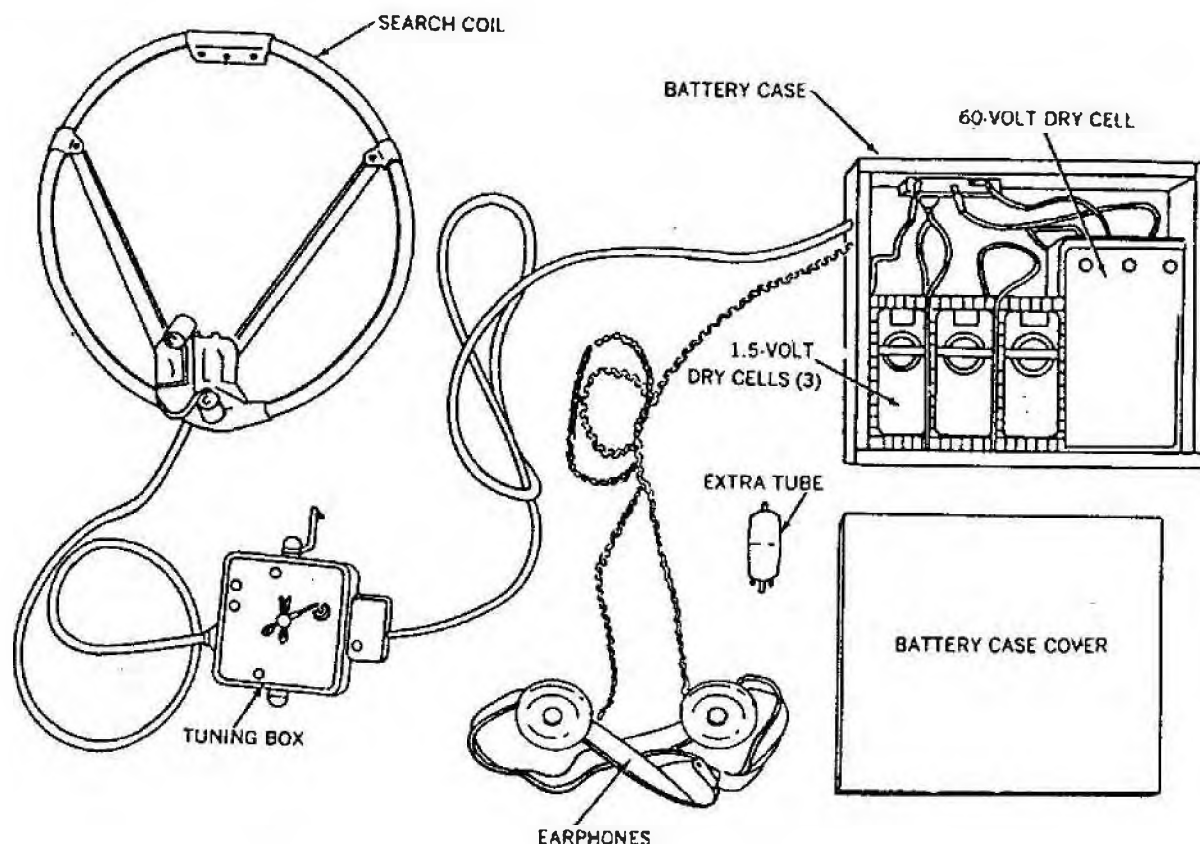


Figure 7-14. Soviet mine detector, Model VIM, 203M.

b. Physical Features.

Element	Physical data	Weight (lb)
Head assembly	38.0cm diameter search coil	14.5
Search handle	1.8cm, 3-section metal or wooden pole, or rifle.	
Amplifier	2-tube oscillator tuning-box mounted on the search handle.	11.9
Power supply	Battery case containing extra tubes; an A-battery consisting of four 1.5v dry cells (3 in use, the 4th used as a booster); 60-v B-battery; and battery case carried in haversack.	
Controls	Tone regulator located on tuning box.	26.4
Aural indicators	Headphones.	
Carrying case	Disassembled apparatus packed into the one haversack containing the power supply.	26.4
	Total	

c. Functioning. The VIM-203M detector oper-

ates on the "beat frequency" principle. The tone in the earphones changes in pitch rather than in volume; a buzzing sound occurs only when the search coil is held over a metallic object.

7-16. Soviet Mine Probes

(fig. 7-15)

The Soviet probes are generally made of metal or wood. They are designated as normal, all-metal, sectional, folding, double-ended, multipronged, short, and Vladimirov. The Vladimirov probe, the most complex of all, is used to detect clockwork delay fuzes and aerial bombs. It is made in six 1.5-meter, 0.8-centimeter diameter hollow sections joined together with metal collars. The tip is bullet-shaped, and on the other end is a microphone and a cross-handle. Upon contact with the mine, the ticking of clockwork devices can be heard through the microphone and felt through the length of the probe. The Vladimirov probe, however, is suitable only for mine location in holes or soft loose ground.

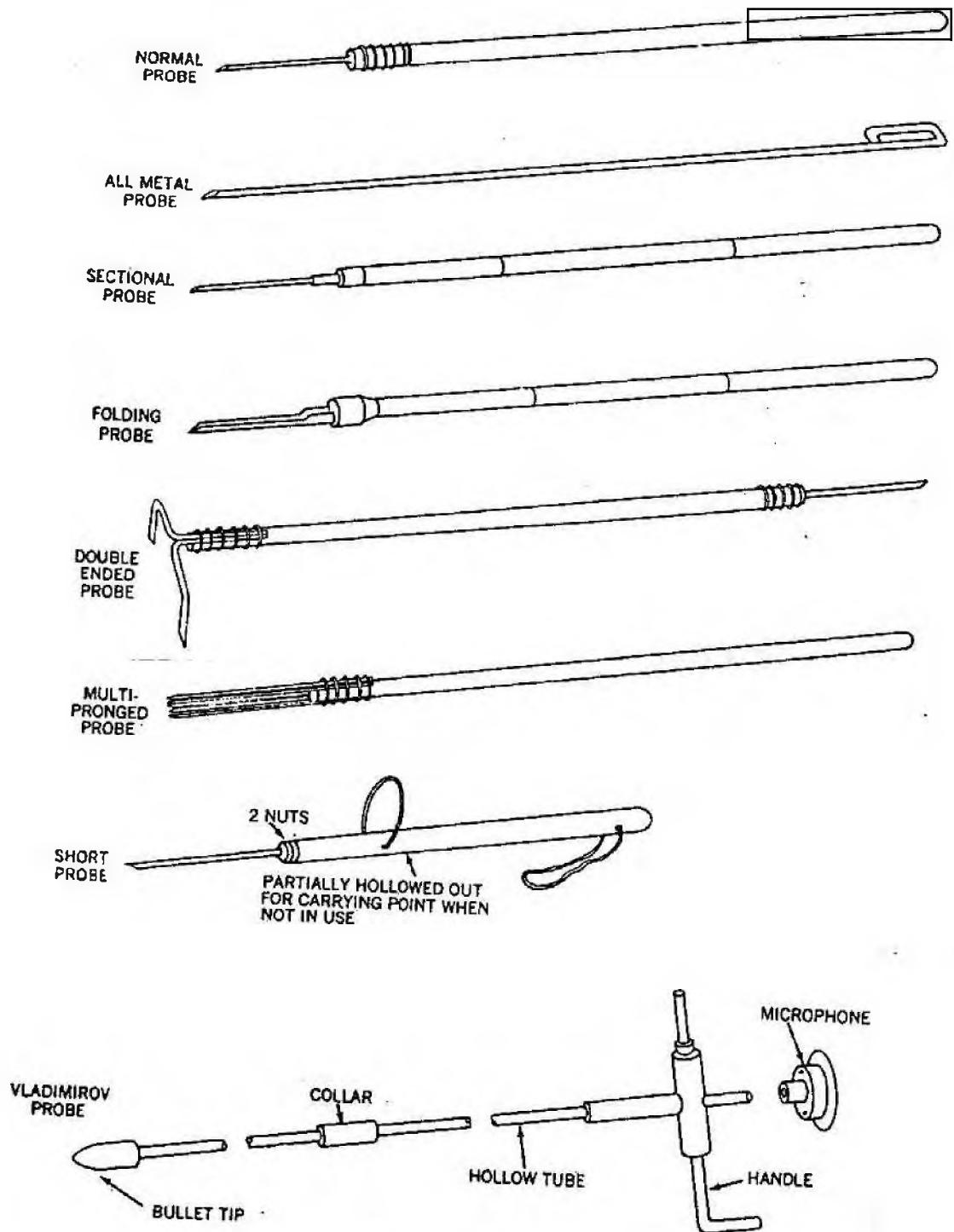


Figure 7-15. Soviet mine probes.

Section III. SOVIET MINE BREACHING EQUIPMENT

7-17. UZ-1 Bangalore Torpedo

The UZ-1 bangalore torpedo is designed for either pull or push emplacement in a minefield.

Each section of a bangalore, consisting of a metal tube 6.6 feet in length and 2 inches in diameter, contains 2 pounds of explosive per linear foot.

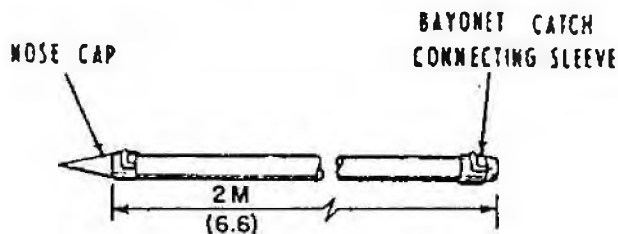


Figure 7-16. Soviet bangalore torpedo, UZ-1 linear charge.

Collars are furnished for connecting the sections, and the depth of clearance across a minefield is limited only by the manageable weight of the sections that mine-clearing details can push across the field. When detonated, a single linear charge clears a path from 4 to 6 feet wide. When necessary, the elements of the UZ-1 charges may be used to assemble double and triple element linear charges by means of special collars provided (fig. 7-16).

7-18. BDT Explosive Line Charge

The BDT explosive line charge (fig. 7-17) is assembled in a rear area and towed by a tank at a speed under 6 mph to the edge of a minefield and then pushed by the tank into the minefield. It consists of 3 separate linear charges, a nose section, and a detonator box. Each linear charge may be assembled to any desired length by connecting 6.5 foot sections together with threaded collars. A squad of soldiers can assemble a 500-meter triple

charge in 1-1½ hours. The light sheet metal 2-inch diameter tubular sections are filled with cast TNT explosives at a ratio of 19.6 pounds per linear meter. The BDT is versatile in that it may be used as a single, double, or triple charge up to 500 meters in length. The forward end section is fitted with a roller to facilitate emplacement of the charge in a minefield. A metal shield mounted above the roller is provided to deflect small arms fire, preventing premature detonation of the charge by an enemy defending a minefield. The

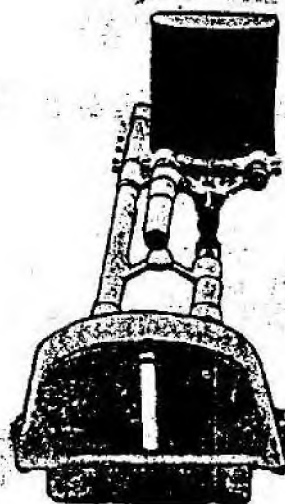


Figure 7-17. Soviet explosive line charge.



Figure 7-18. Soviet mine-exploding plow.

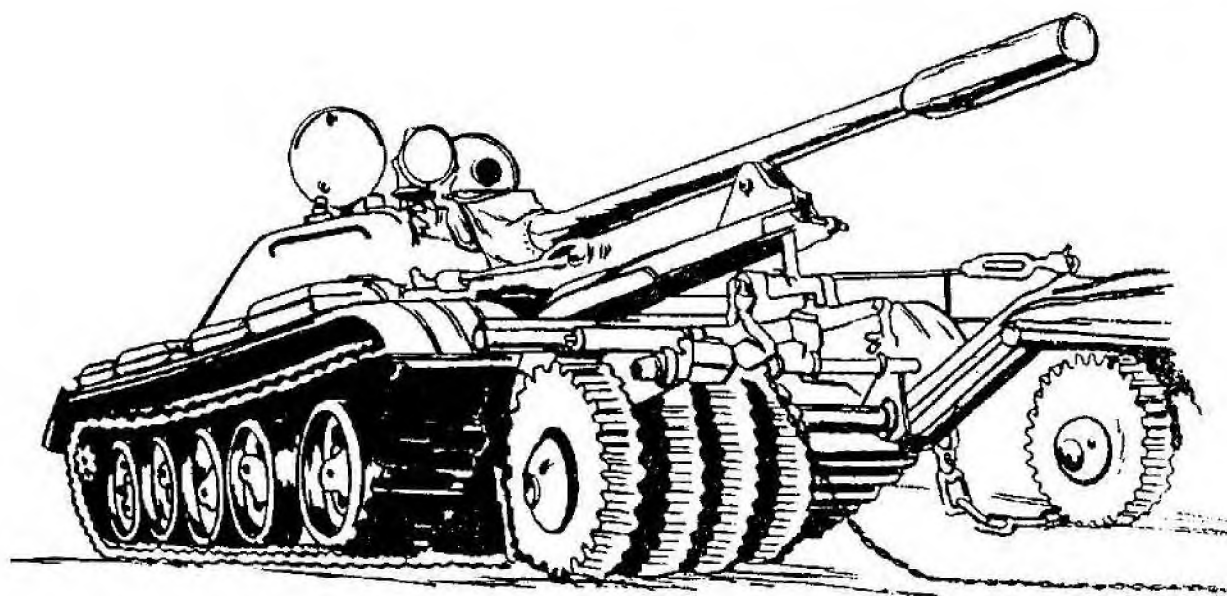


Figure 7-19. Soviet PT 54 mine clearing roller exploder.

line charge can be detonated by either one of two methods—First, by an electric blasting cap initiated through a firing cable connected to the batteries of the pusher vehicle; Second, by the detonator box which contains a number of percussion detonators connected to a booster charge and which are initiated by machinegun fire from the pusher tank. The triple line charge will clear a path 6 meters wide along the total length of the charge.

7-19. Mechanized Equipment for Minefield Breaching

The Soviets use mechanized equipment in minefield breaching as well as manual and blasting methods. Tanks equipped with special exploders, such as plows (fig. 7-18), flails, roller exploders

(figs. 7-19 and 7-20), or mine excavators are used.

7-20. Clearing Lanes by Soviet Roller Exploders

Soviet roller exploders, as a rule, have two independent sections of rollers secured to the front of the tank in line with its tracks. As the exploder is pushed, it clears two strips in front of the tank tracks each about 1.2 meters wide. The area between the sections remains uncleared. Tanks following behind may proceed only in the lane provided by the two cleared strips, which slows the advance. To quickly widen the lane and permit faster passage, two or three tanks, in wedge formation and 25-30 meters distant from each other, are usually assigned to clear a lane as shown in figure 7-21.

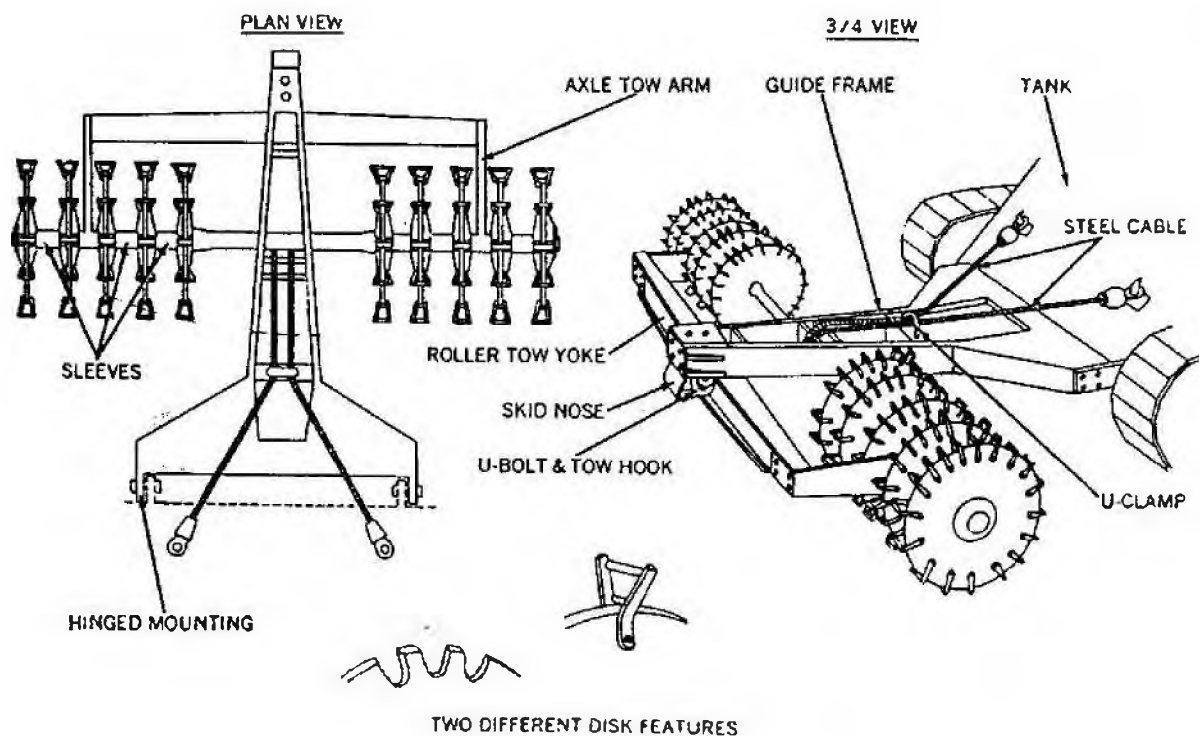
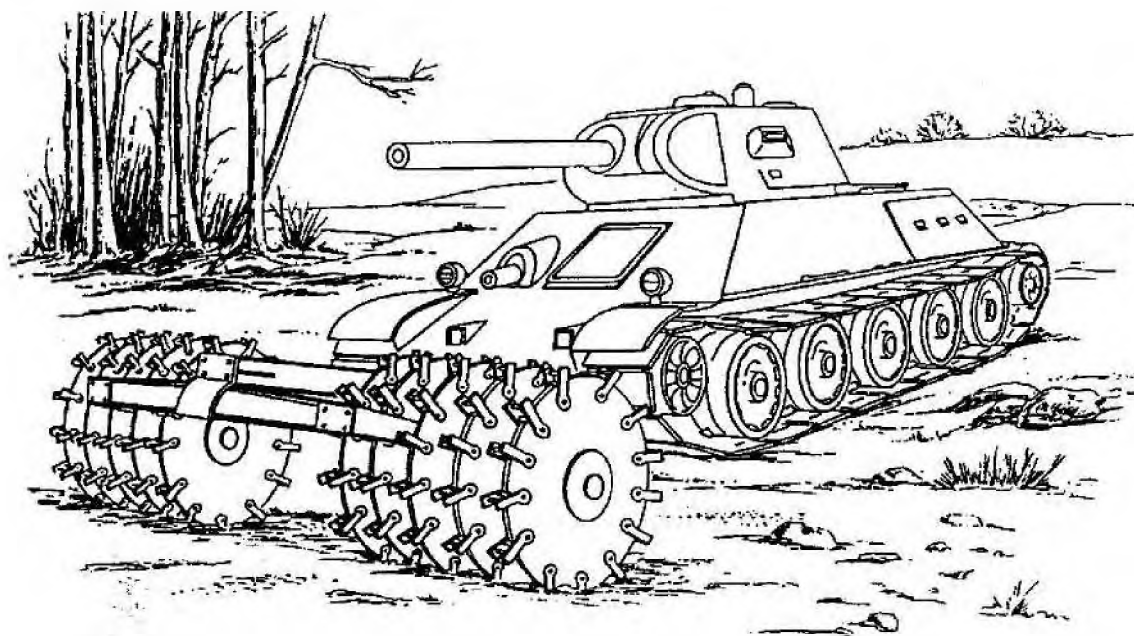


Figure 7-20. Soviet mine clearing roller (disk type).

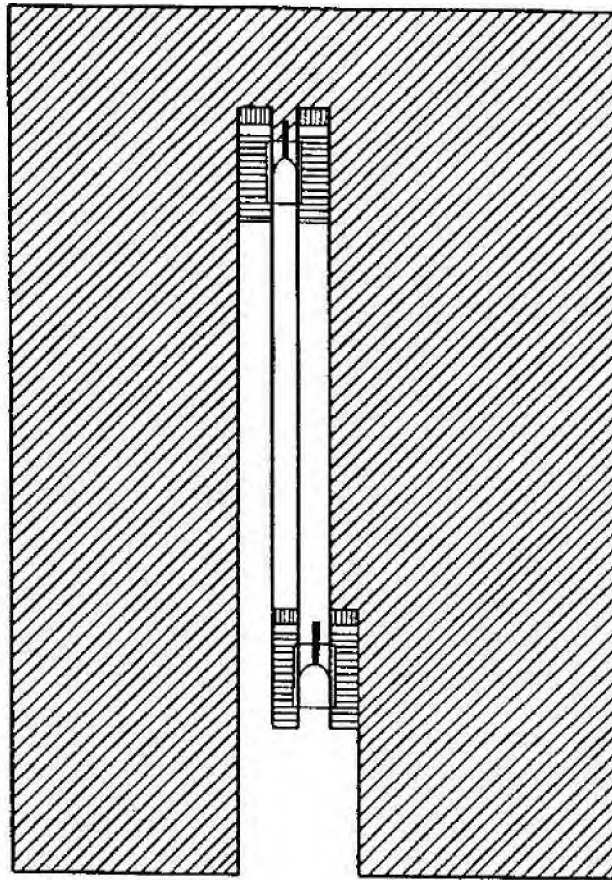


Figure 7-21. Soviet tanks and exploders breaching a minefield.

Section IV. OTHER EURASIAN COMMUNIST COUNTRIES' EQUIPMENT

7-21. Mine Laying Equipment

The Eurasian Communist countries largely rely on Soviet doctrine, techniques and equipment in mine laying. A few pieces of equipment of certain Communist countries are discussed in several following paragraphs.

7-22. Mine Laying and Spacing Cords (Czechoslovakia)

Four types of cords are used in the Czechoslovakian Army in laying antitank and antipersonnel minefields and road-mine barriers. Around 1950, the antitank and antipersonnel spacing cords were combined into one with alternating X, O, and □ markers spaced 2 meters apart in that order over the length of the cord.

a. Boundary Tape for Four-Row Antitank Mine Belt. This tape consists of a cord 33 meters long with an indicator at each end and three rings spaced 8 meters apart from one end. It is used to

establish the boundary of a section of a hasty antitank minefield (A, fig. 7-22). The indicator, spaced 9 meters from the first ring, is placed at the intermediate marker or reference stake and the cord is stretched out toward the enemy. The rings and the other indicator mark the location of the beginning of each row of mines.

b. Simple Antitank Mine-Spacing Cord. This cord is 50 meters long with black markers (for locating the position of antitank mines). These are spaced 6 meters apart, other markers are spaced at varying distances from each end of the cord (B, fig. 7-22). When used, the O, X, □, or 0 is placed on the row marker of the boundary tape and the cord is stretched out perpendicular to it. Mines are laid at the 6-meter interval markers. A staggered pattern may be made by placing a different indicator in succeeding boundary tape row markers.

c. Antipersonnel Mine-Spacing Cord. This device is used for laying belts of pressure type

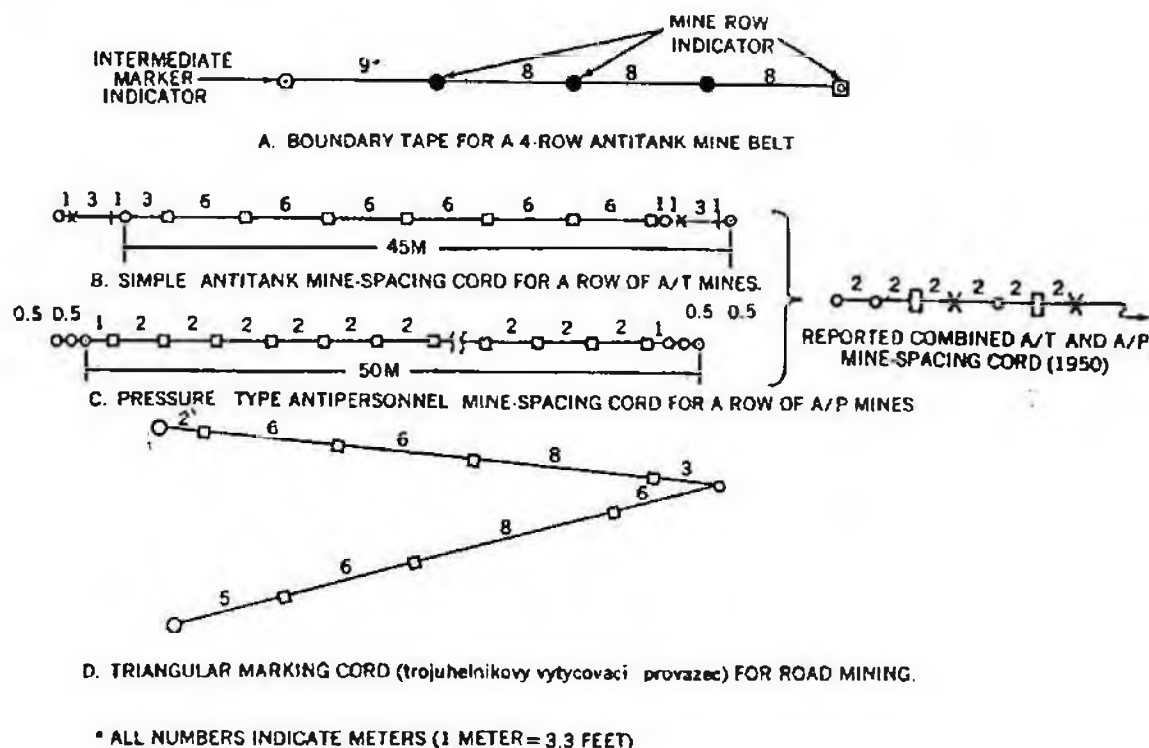


Figure 7-22. Mine laying and spacing cords (Czechoslovakia).

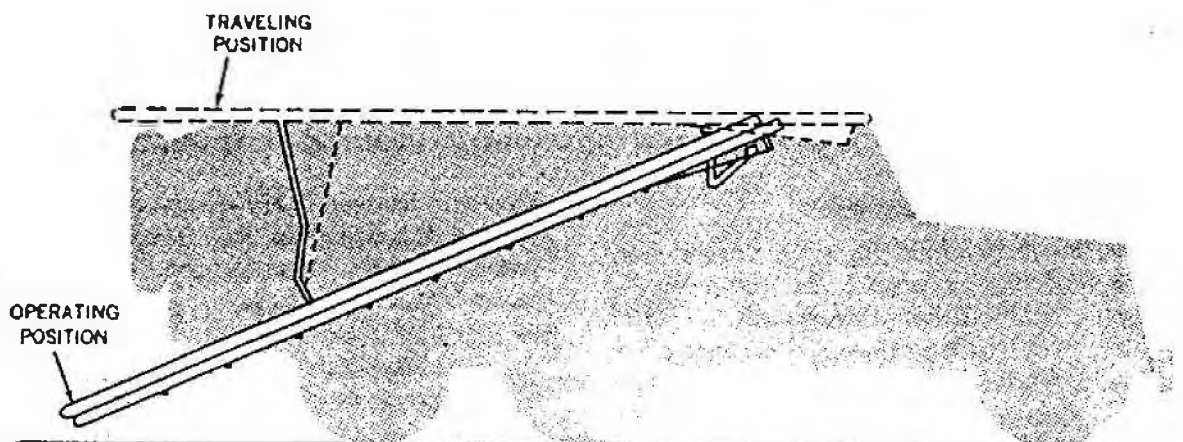


Figure 7-23. Mine distributor, vehicle-mounted (Poland).

antipersonnel mines (PP-Mi-D) in the same manner as that of the cord discussed in *b* above (C, fig. 7-22).

d. Combined Antitank-Antipersonnel Mine Spacing Cord. This seems to be an attempt to eliminate the need for two cords by combining two into one. In this respect, the combined cord resembles the German mine-spacing cord, but has fewer markers. It has two 0s and one \square spaced 2 meters apart from one end for staggering the po-

sition of succeeding rows of mines from the boundary tape. The mine-spacing markers X, O, and \square are spaced 2 meters apart throughout the length of the cord so that antitank mines as well as anti-personnel mines may be spaced correctly and accurately.

e. Triangular Marking Cord for Road Mining. This device is used for the rapid irregular spacing of mines in a road during withdrawal operation (D, fig. 7-22). It permits quick relocation of the

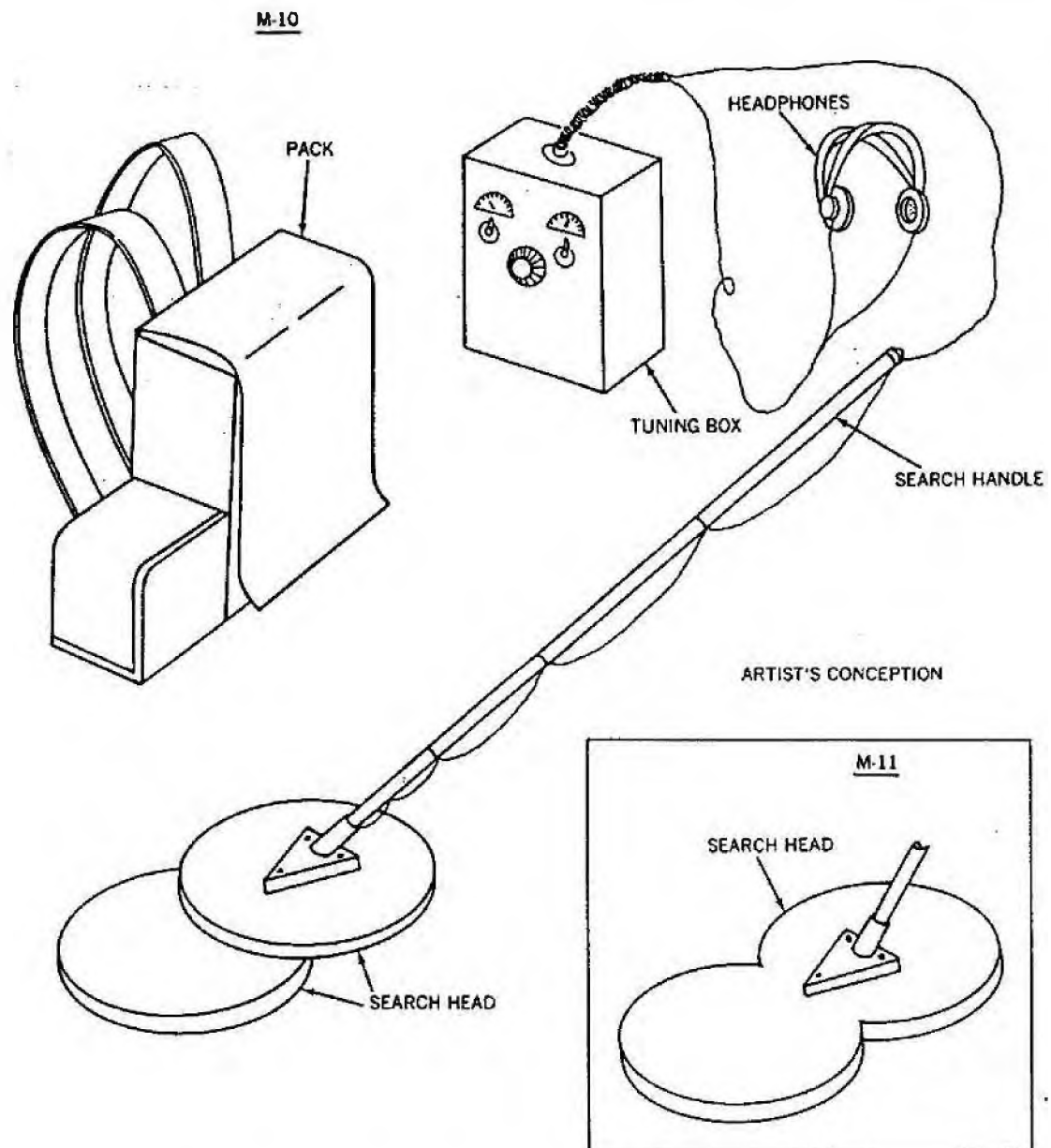


Figure 7-24. Mine detector, M-10 and M-11 (Czechoslovakia).

mines if the area is retaken. The apex of the angle is laid in the roadway toward the enemy and the two legs are stretched out to either side of the road. Succeeding triangles of mines are laid away from the enemy with the apex either within the preceding triangle or somewhere along its base. Road-mine barriers laid with the cord are mostly 100 to 500 meters in depth.

7-23. Mine, Distributor, Vehicle-Mounted (Poland)

This device (fig. 7-23) is composed of a single chute hung over each side of the vehicle that car-

ries the mines. The spacing is determined by the speed of the vehicle and the agility of the crew in placing them in the chutes. This distributor is intended primarily for hastily placing mine barriers by retreating troops in light scrub land where undergrowth hides the mines from observation. The chutes are 4.6 meters long, 40.6 centimeters wide, and 12.7 centimeters high.

7-24. Mine Detection and Breaching Equipment

a. Czechoslovakia and East Germany. These countries have designed and produced mine detec-

tion and clearing equipment. This equipment has been influenced by Soviet design. The mine detectors M-10 and M-11 (Czechoslovakia) (fig. 7-24) operate on the heat frequency oscillator principle, and differ only in the construction of the search head. The M-11, though of the same shape as the other, consists of a single continuous plate. A detection range of approximately 1.5 meters is claimed.

(1) *Detector head assembly.* The M-10 search head consists of two detachable circular plates 11.7 inches in diameter and 1.1 inches thick. The top plate, which holds the search handle, overlaps the bottom plate by 3.9 inches. The M-11 search head consists of a single continuous plate of the same shape and dimensions of that of the M-10.

(2) *Search handle.* This generally consists of four jointed aluminum alloy sections, each 19.5 inches long. Two additional sections, however, are stored in the back pack for use if necessary.

(3) *Tuning box.* The dimensions are 4.6 by 3 by 1.9 inches. It is rectangular in shape.

(4) *Power supply.* Three 20- to 25-volt dry cell batteries are contained in this back pack, along with a spare set.

(5) *Weight.* The total weight of the detector is approximately 26.4 pounds.

b. *Communist China, North Korea, and North Vietnam.* These countries have shown little interest in mine detection and breaching equipment. These countries rely on visual detection or probing for the location of minefields, and on hand removal or in-place destruction of individual mines by the use of expedient explosive charges. Communist China was furnished limited quantities of Soviet bangalore torpedoes and VIM 203 detectors during the Korean War and the Communist Chinese have copied and manufactured these items for training their military personnel.

CHAPTER 8

FREE WORLD COUNTRIES LISTED

8-1. Text Coverage

The mine warfare equipment of the following Free World countries has been included in this text:
text:

Belgium	Spain
Denmark	Sweden
France	Switzerland
Israel	Turkey
Italy	United Kingdom
Japan	West Germany
Netherlands	

8-2. Capability

The Free World countries listed are considered to have a significant mine warfare capability. Characteristics of their mines and their laying, detection and breaching equipment are discussed in subsequent chapters of the text.

CHAPTER 9

MINES AND FUZES OF FREE WORLD COUNTRIES

9-1. Organization of This Chapter

Mines and fuzes are listed by country of manufacture, with the countries arranged in alphabetical order—Belgium, Denmark, and so forth. For each country, mines and fuzes are listed in this order—antitank mines and antivehicle mines first, then antipersonnel mines and fuzes.

9-2. Mine, Antipersonnel, Model U/1 (Belgium)

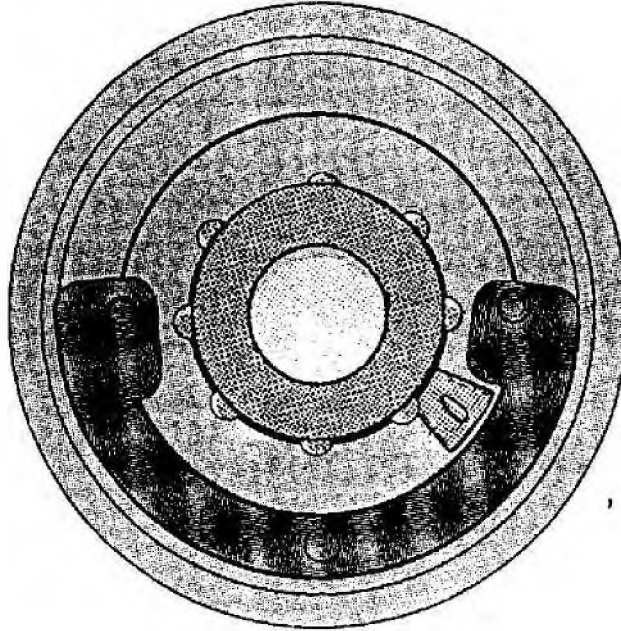


Figure 9-1. Mine, Antipersonnel, Model U/1.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.25" Height: 2.55"	4.85 oz	Pressure	No data	2 1 oz TNT	None

This is a blast type mine made with a plastic case. It is cylindrical in shape with 1 detonator well.

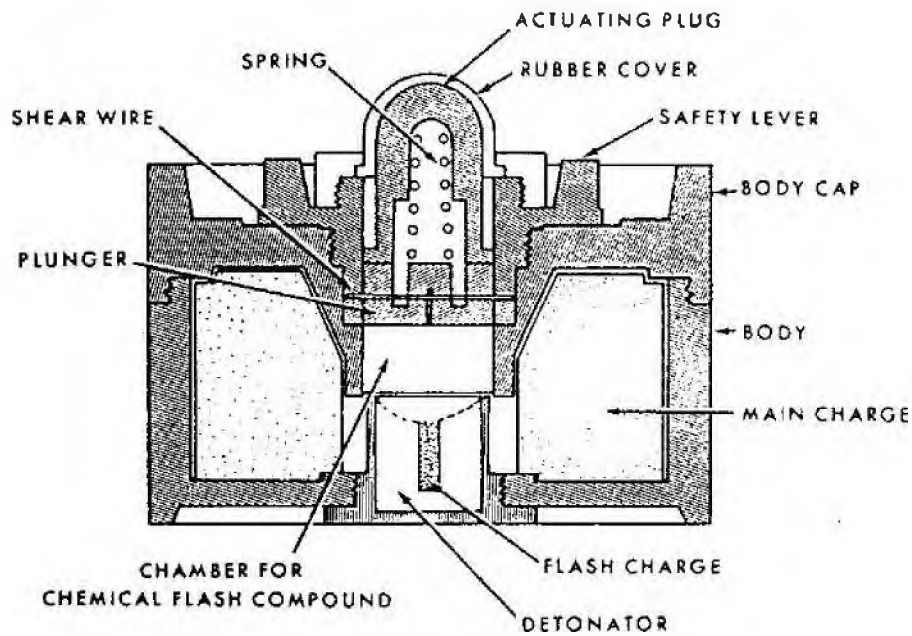


Figure 9-2. Mine, Antipersonnel, Model U-1.

9-3. Fuze, Mine, Model M.30 TS (Belgium)

Dimensions	Case	Internal action	Operating force
Diameter: 1.2" Height: 2.4"	Aluminum	No data	132-264 lb

a. *General.* The fuze weighs about 0.4 oz. It has 2 steel firing pins.

b. *Use.* It is used with MIII TS mine.

c. *Functioning.* The fuze functions upon displacement of the "pressure membrane" by 0.06" to 1.2".

9-4. Fuze, Mine, Pull, Model P.A.T. (Belgium)

Dimensions	Case	Internal action	Operating force
Diameter: 1" Height: 1.6"	Plastic	Pull traction	6.6 to 9.9 lb

General. Used as a trip wire activated fuze. When from 6 to 10 lbs pull is exerted on the trip

wire a glass coated traction device ignites an incendiary compound detonating the mine.

9-5. Fuze, Device Antilift, for Antitank Mines (Belgium)

Dimensions	Case	Internal action	Operating force
Diameter: about 3.2" Length: about 1.8"	Plastic	No data	No data

a. General. This is a double-acting type using trialen as explosive material. It has 2 steel firing pins.

b. Functioning. The primer ignites two small blocks of hexolite (RDX/TNT, 80/20) which in turn ignites the trialen. The device functions upon raising the mine about 1.2 inches.

9-6. Mine, Antitank, Model M/47-1 (Denmark)

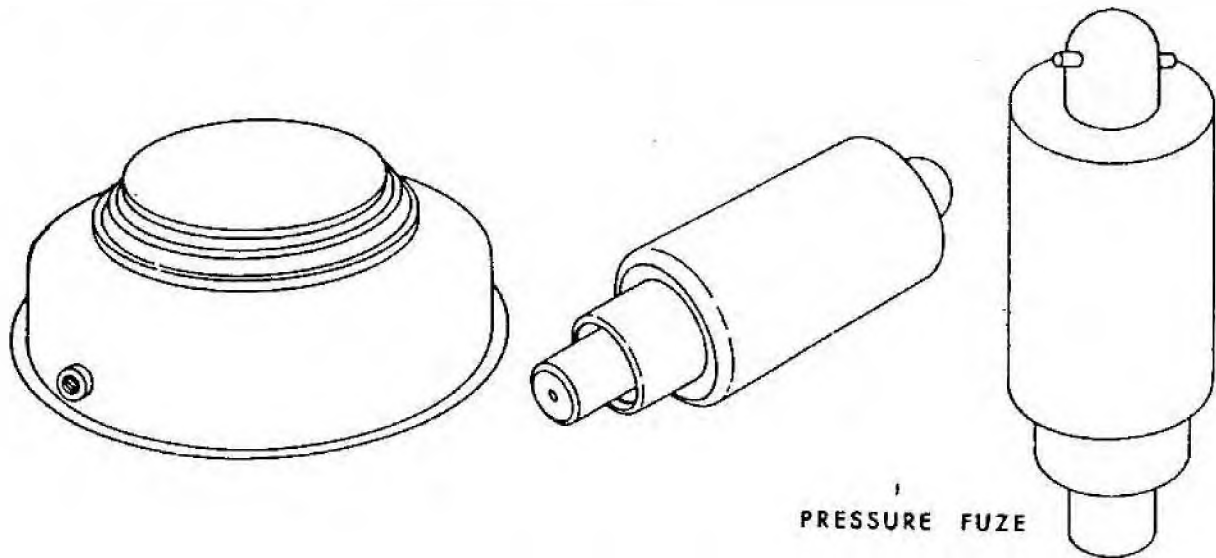


Figure 9-3. Mine, Antitank, Model M/47-1.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12.4" Height: 3.6"	22 lb	Model 47-I pressure or Model 47-II anti- disturbance	550 lb. (approx)	14.3 lb. cast TNT	6.6 oz. pressed TNT (3-2.2 oz. each)

a. General. This mine is similar to the German Tellermine 43. The sheet steel case has a raised pressure plate on its top side. A wooden cylinder remains in the main fuze well while the mine is in transport. Two additional wells are provided for boobytrapping—one in the side and the other in the bottom of the mine. A ring fitted with a threaded lug that screws into the side fuze well serves as a carrying handle.

b. Use. This mine is used in roadblocks and defense systems to damage the tracks of armored vehicles.

c. Functioning. Pressure imposed on the top is transmitted by the pressure plate to the fuze, starting the firing chain—detonator, booster, and main charge. The release of pressure from the top of the antidisturbance fuze by removing the pressure plate will also actuate the fuze and the mine.

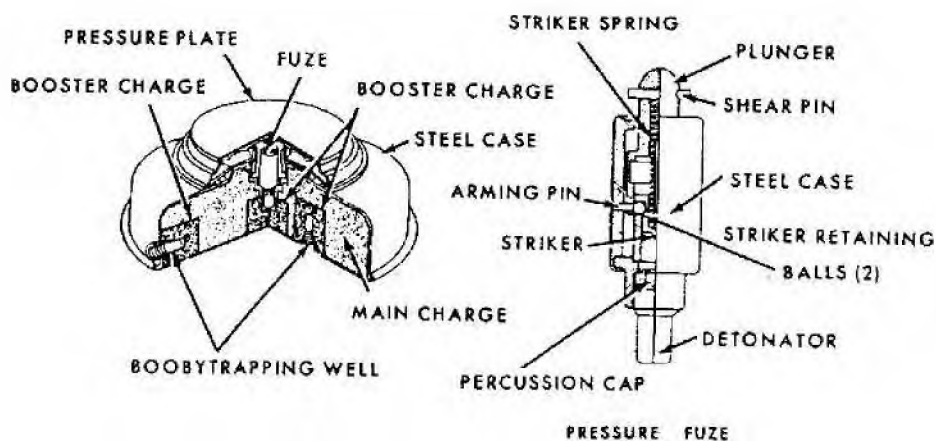


Figure 9-4. Mine, Antitank, Model M/47-1.

d. Installing and Arming.

- (1) Unscrew the pressure plate.
- (2) Remove the wooden transit block from the fuze well.
- (3) Attach a detonator to the fuze (pressure or antidisturbance).
- (4) Place the fuze in the fuze well.

(5) Replace the pressure plate (if using the antidisturbance fuze, screw the pressure plate down until the arming pin is heard to snap).

e. Disarming. This mine should not be hand disarmed, as it may have an antidisturbance fuze, which cannot be ascertained by inspection. It should be detonated in place.

9-7. Mine, Antitank, Plastic, Model M/52 (Denmark)

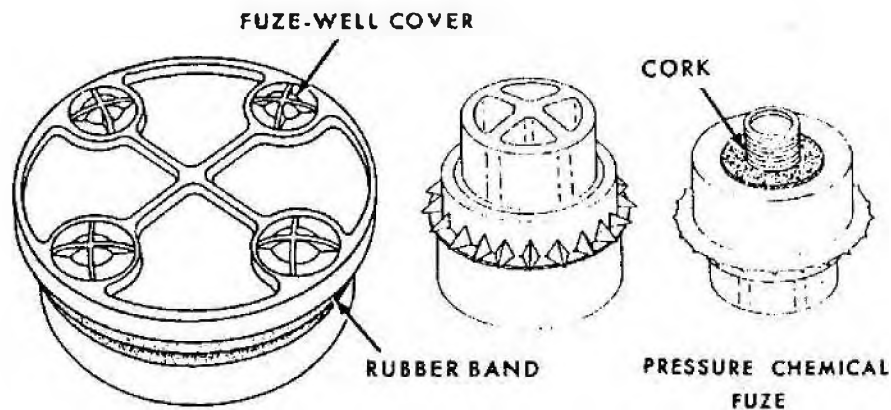


Figure 9-5. Mine, Antitank, Plastic, Model M/52.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.8" Height: 4.9"	23.8 lb.	Pressure-chemical	1200 lb	18.5 lb. cast TNT	0.8 lb. pressed TNT

a. General. This mine has a bakelite case of two sections. The lower one contains the explosive and booby-trapping well and the upper one acts as a pressure lid. The pressure lid has four fuze well covers fitted with rubber gaskets. In the side walls of the case are four holes to receive shear lugs introduced through the fuze wells to lock the two parts of the case together. The joint between the two parts is sealed with a broad band of rubber. This mine has one booby-trapping fuze well.

b. Use. This mine is used to damage tracks or suspension systems of armored vehicles. Ordinarily it is buried about 5.0 centimeters below the surface of the ground.

c. Functioning. The shear lugs are fractured by pressure, which forces the lid down and actuates the fuzes. These fire the detonators and booster charges which in turn explode the main charge.

d. Installing and Arming.

- (1) Remove the fuze well covers.
- (2) Roll down the broad rubber band.
- (3) Put the four shear lugs in place through the fuze wells, passing them through the holes in the case and the lid.
- (4) Replace the rubber band.
- (5) Place the detonators in the fuze wells.
- (6) Screw the fuzes in place.

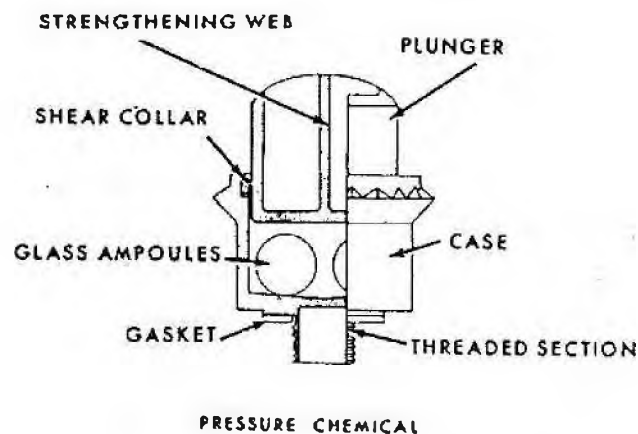


Figure 9-8. Mine, Antitank, Plastic, Model M/52.

(7) Replace the fuze well covers, making certain that the gaskets are in position.

e. Disarming.

(1) Inspect for and remove any antilift devices.

(2) Remove the fuze well covers.

(3) Remove the fuzes from the mine.

(4) Remove the detonators from the fuze wells.

(5) Take the mine, fuzes, and detonators to a safe storage or disposal area.

9-8. Mine, Antitank, 52/53 Panzermine (Denmark)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 5.4"	24.3 lb.	Chemical Pressure	220-330 lb	Cast TNT 19.0 lb approx.	0.8 lb approx.

a. General. The mine is cylindrical in shape, with a plastic body. It has an additional well in bottom for an antennae fuze.

b. Use. It is laid 1"-2" below ground surface on 6.5' centers to obviate sympathetic firing.

c. Functioning. A pressure of about 130-200 lb,

applied to the top of the fuze, causes the shear collar to fail and the plunger to crush the two ampules of chemicals. One of the ampules contains a mixture of potassium-sodium-mercury, the other ethyl nitrate. Mixture of the contents of the two vials causes a flash, setting off the detonator.

9-9. Mine, Antipersonnel, Model 47-1 (Denmark)

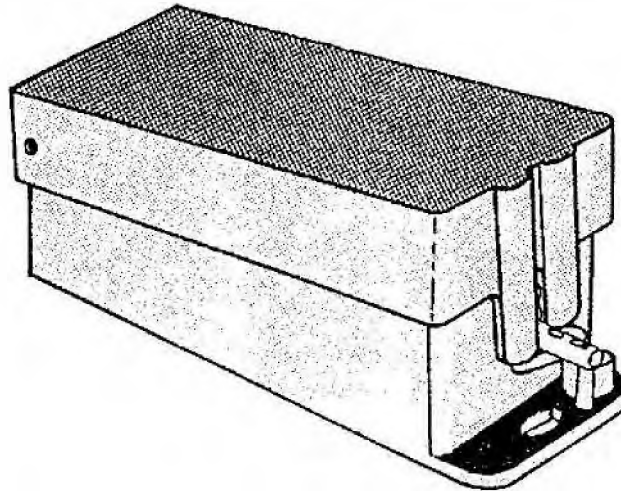


Figure 9-7. Mine, Antipersonnel, Model 47-1.

Dimensions	Wt.	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 6.1" Width: 2.1" Height: 3"	1402	Pressure	26.0 lb	TNT 7 lb	None

a. General. The case material is wood or bakelite.

b. Functioning. The mine functions by pressure-operated pin-withdrawal igniter or chemical igniter.

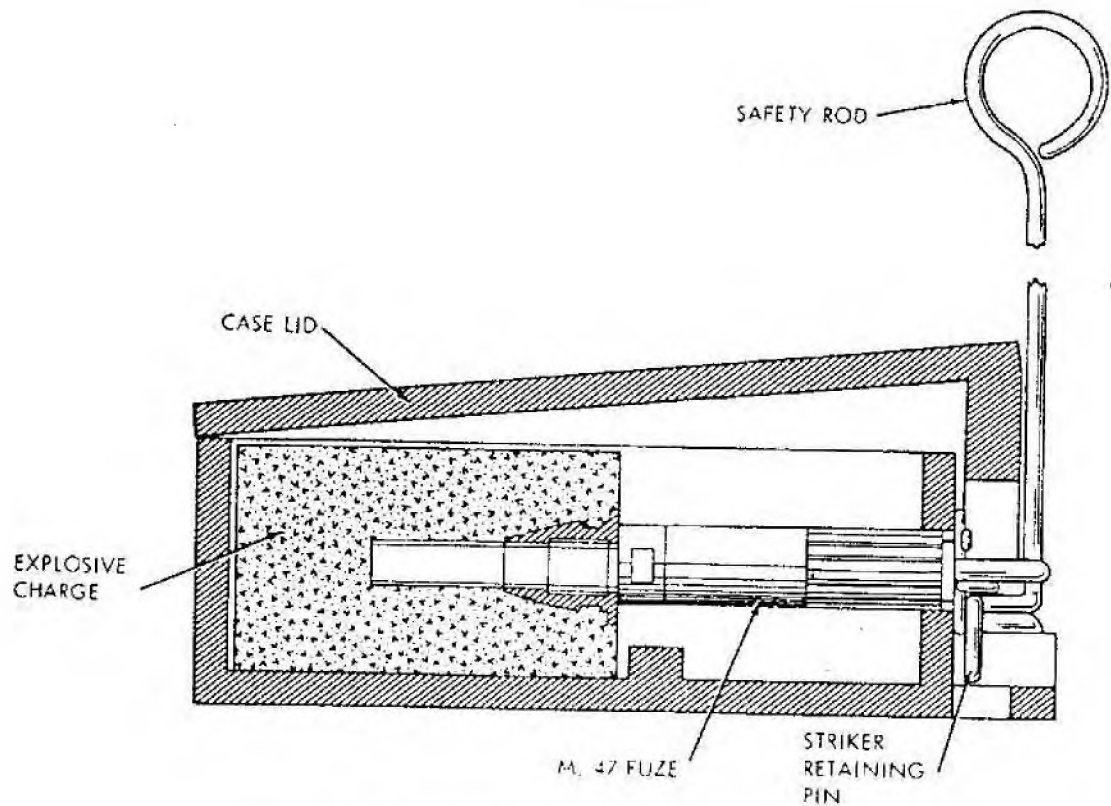


Figure 9-8. Mine, Antipersonnel, Model 47-1.

9-10. Fuze, Pull M/47 (Denmark)

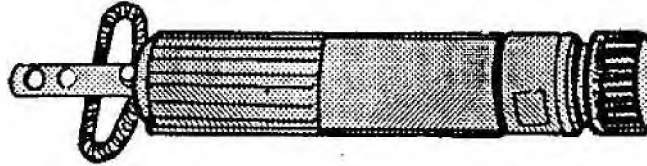


Figure 9-9. Fuze, Pull M/47.

Dimensions	Case	Internal action	Operating force
Diameter: 0.87" Length: 2.87"	Steel	Pressure, mechanical	500 lb (approx)

a. *General.* Body is of steel and cylindrical in shape.

b. *Use.* It is used in M/47-1 AT mine.

c. *Functioning.* Pressure of about 500 lb causes the shear pin to fail, allowing the spring-loaded striker to be driven down on the percussion cap, firing the detonator assembly.

d. *Installing and Arming.*

(1) Screw a cap-and-detonator assembly in the base of the fuze.

(2) Place the fuze in the mine.

e. *Disarming.*

(1) Remove the fuze from the mine.

(2) Unscrew the detonator assembly from the fuze.

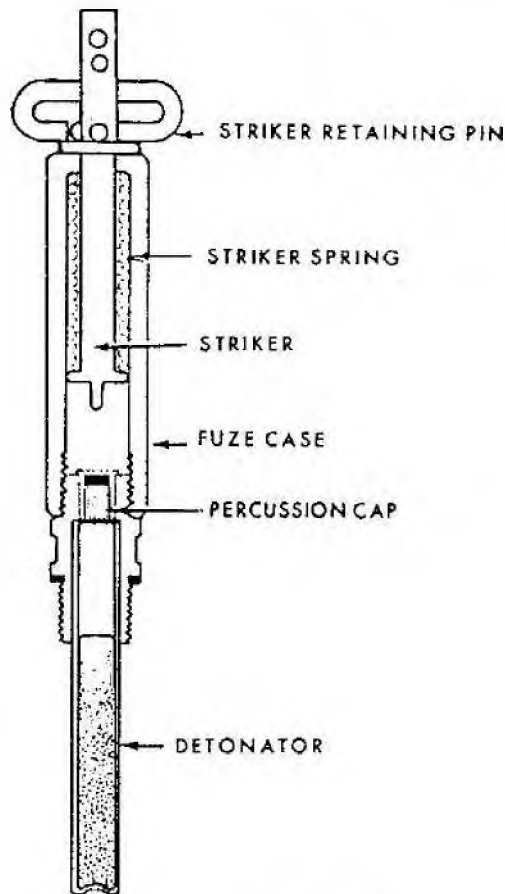


Figure 9-10. Fuze, Pull, M/47.

9-11. Fuze, Pressure, M/52

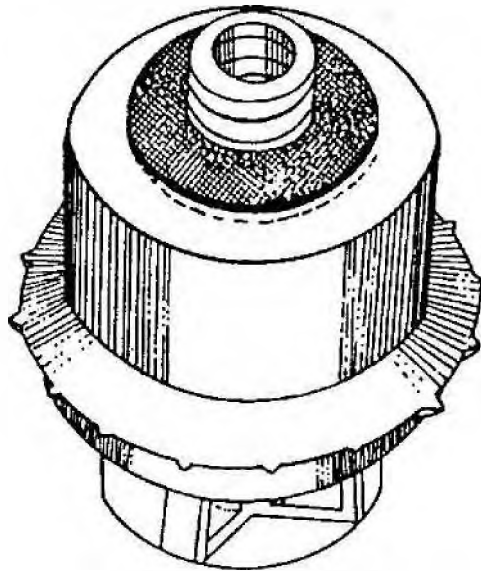


Figure 9-11. Fuze, Pressure, M/52.

Dimensions	Case	Internal action	Operating force
Diameter: 1.39" Height: 1.83"	Plastic	Pressure Chemical	132-198 lb

a. General. Fuze case is made of polystyrene plastic.

b. Use. Employed in the undetectable antitank mine, Model 52.

c. Functioning. A pressure of about 130-200 lb, applied to the top of the fuze, causes the shear collar to fail and the plunger to crush the two ampoules of chemical. One of the ampoules contains a mixture of potassium-sodium-mercury, the other

ethyl nitrate. Mixture of the contents of the two vials causes a flash, setting off the detonator.

d. Installing and Arming.

(1) Place a detonator in the fuze well of the mine.

(2) Screw the fuze into the well.

e. Disarming.

(1) Unscrew the fuze from the mine.

(2) Remove the detonator from the mine.

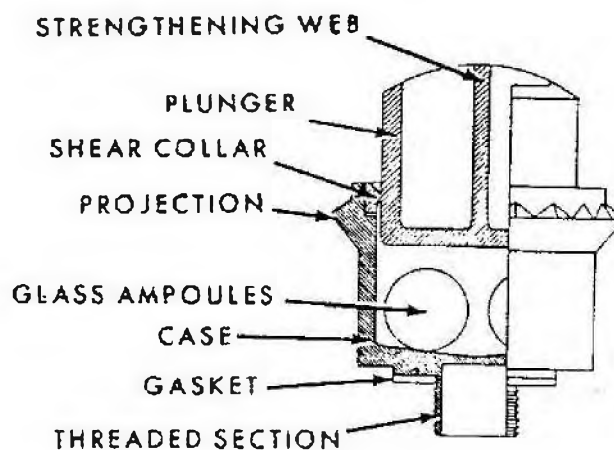


Figure 9-12. Fuze, Pressure, M/52.

9-13. Fuze, Pressure, M/47-I (Denmark)

Dimensions	Case	Internal action	Operating force
Diameter: 7/8" Height: 2 7/8"	Steel	Mechanical	550 lb approx.

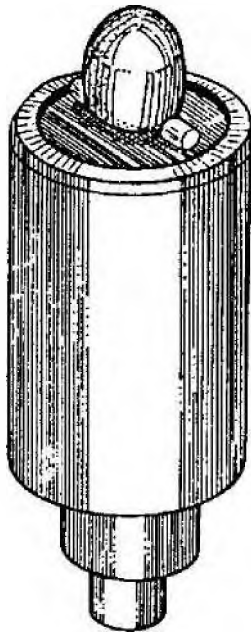


Figure 9-16. Fuze, Pressure, M/47-I.

a. General. This pressure fuze has an instant mechanical, spring-loaded striker with shear pin release.

b. Use. The fuze is used in the antitank mine M/47-I.

c. Functioning. Pressure of about 550 lb causes the shear pin to fail, allowing the spring-loaded striker to be driven down on the percussion cap, firing the detonator assembly.

d. Installing and Arming.

(1) Screw a cap-and-detonator assembly into the base of the fuze.

(2) Place the fuze in the mine.

e. Disarming.

(1) Remove the fuze from the mine.

(2) Unscrew the detonator assembly from the fuze.

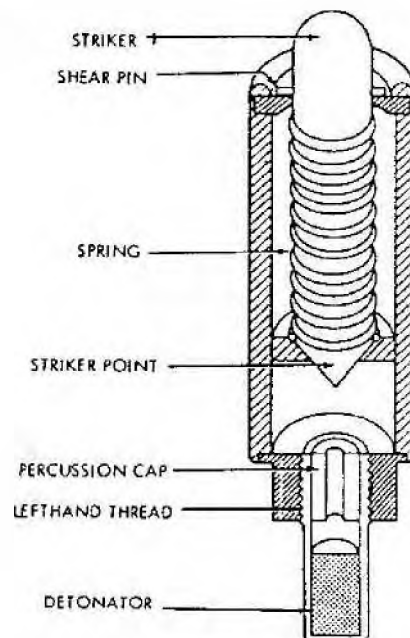


Figure 9-16. Fuze, Pressure, M/47-I.

9-14. Mine, Antitank, Nonmetallic, Model 1951 (France)

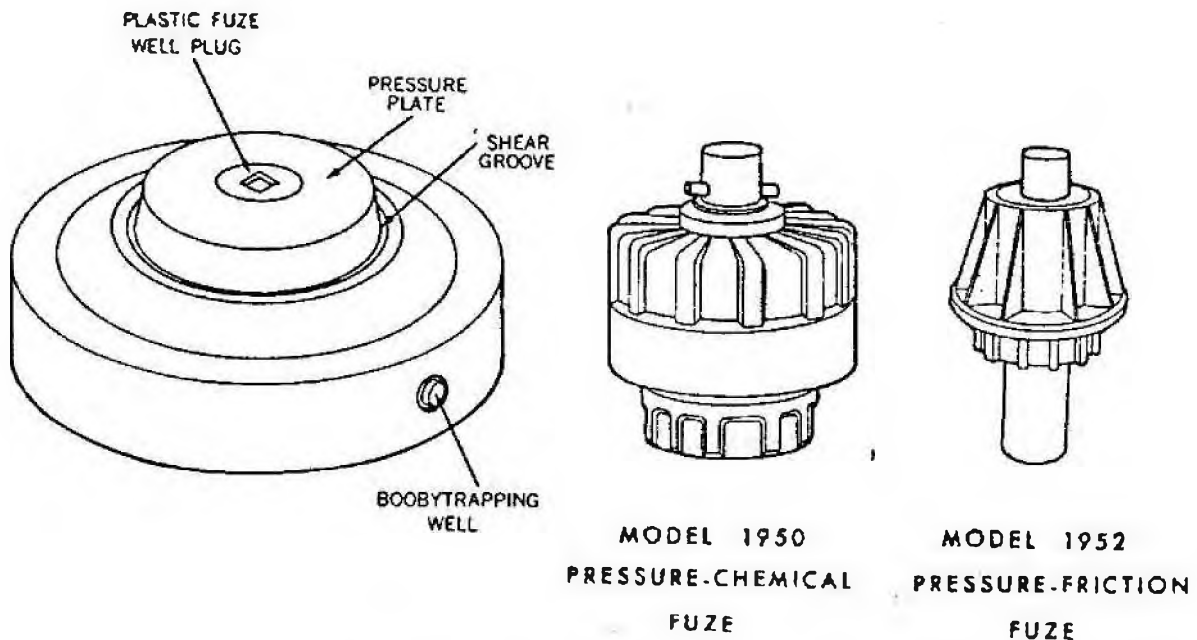


Figure 9-17. Mine, Antitank, Nonmetallic, Model 1951.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.7" Height: 3.6"	15.4 lb	Model 1950 pressure- chemical, or Model 1952 pressure friction.	660 lb. approx.	14.3 lb cast TNT	1.1 lb RDX

a. General. This mine has no case. It consists of three sections of cast TNT reinforced with glass wool (about 5 percent by weight). These include a pressure-plate section, a central core that holds the fuze and detonator, and an outer clamping ring that holds the first two sections together. Every part of the mine except the plastic fuze-well plug, booster container, and fuze is explosive. It is not locatable by conventional electronic detectors. This mine has two secondary fuze wells; one located in the side and one located in the bottom.

b. Use. This is an undetectable mine designed to damage the tracks of medium and heavy armor.

c. Functioning. The unit detonates under pressure on the top. This shears away the pressure plate and actuates the fuze (pressure-friction, Model 1952). The plastic fuze collar fails and a

plastic cone loaded with a glass-and-phosphorus mixture is pressed into a plastic mating sleeve. The friction thus caused flashes the mixture and initiates the firing chain. If the unit is fitted with the Model 1950 pressure-chemical fuze, the pressure breaks a vial of acid that mixes with a chemical powder to produce a flame that starts the firing chain.

d. Installing and Arming.

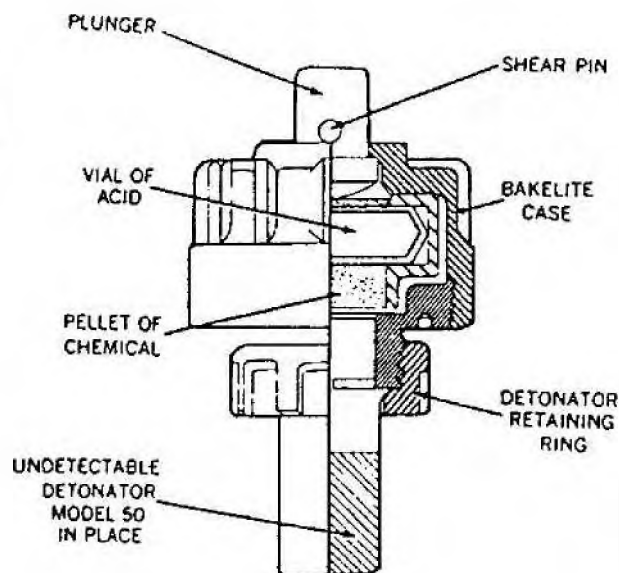
- (1) Remove the fuze well cover.
- (2) Insert a detonator into the fuze (Model 1952 undetectable pressure-friction, or Model 1950 pressure-chemical).
- (3) Put the fuze into the well.
- (4) Replace the fuze well cover (covers must not be interchanged between mines).

e. Disarming.

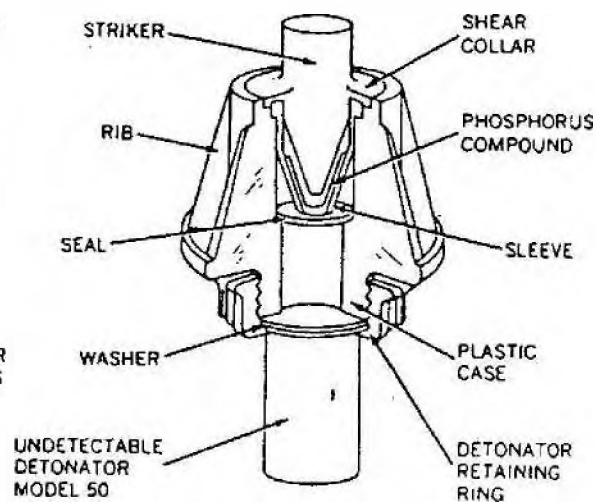
(1) Check for and remove any antilift devices.

(2) Remove the fuze well cover.

(3) Pull the fuze from the mine and separate the detonator from the fuze.



MODEL 1950
PRESSURE-CHEMICAL



MODEL 1952
PRESSURE-FRICTION

Figure 9-18. Mine, Antitank, Nonmetallic, Model 1951.

9-15. Mine, Antitank, Nonmetallic, Model 1947 (France)

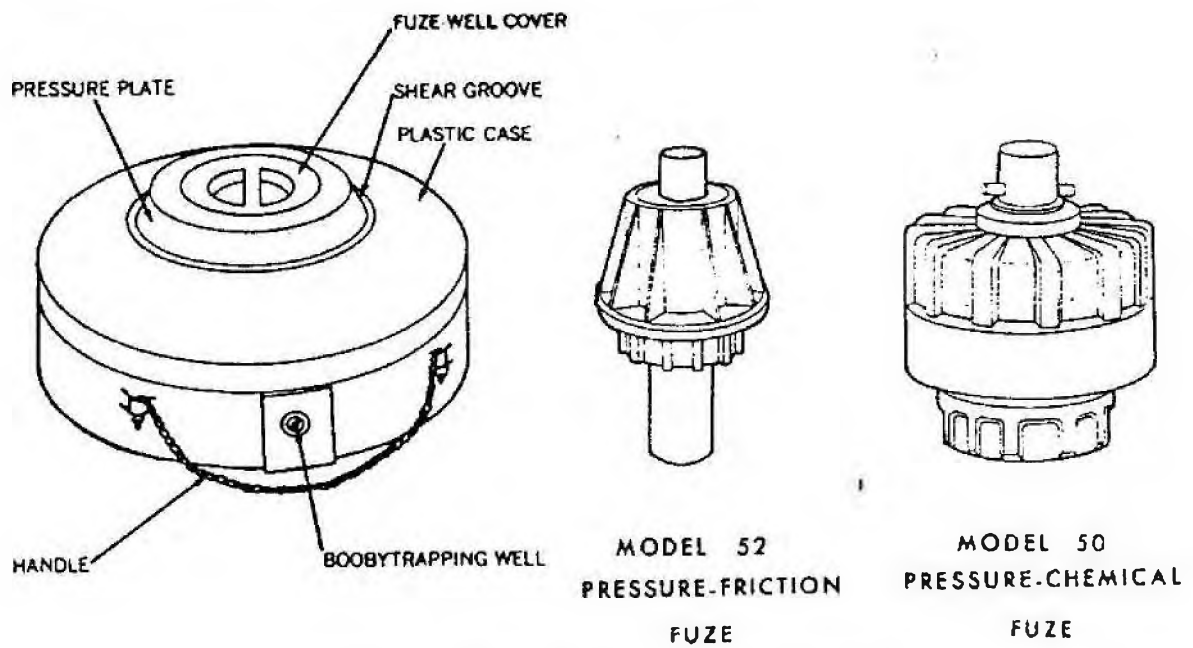


Figure 9-19. Mine, Antitank, Nonmetallic, Model 1947.

Dimensions	Wt.	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 13.2" Height: 4.2"	24.2 lb	Pressure-friction model 52 or pressure-chemical, model 50.	550 lb	12 lb TNT	1.6 oz lead oxide

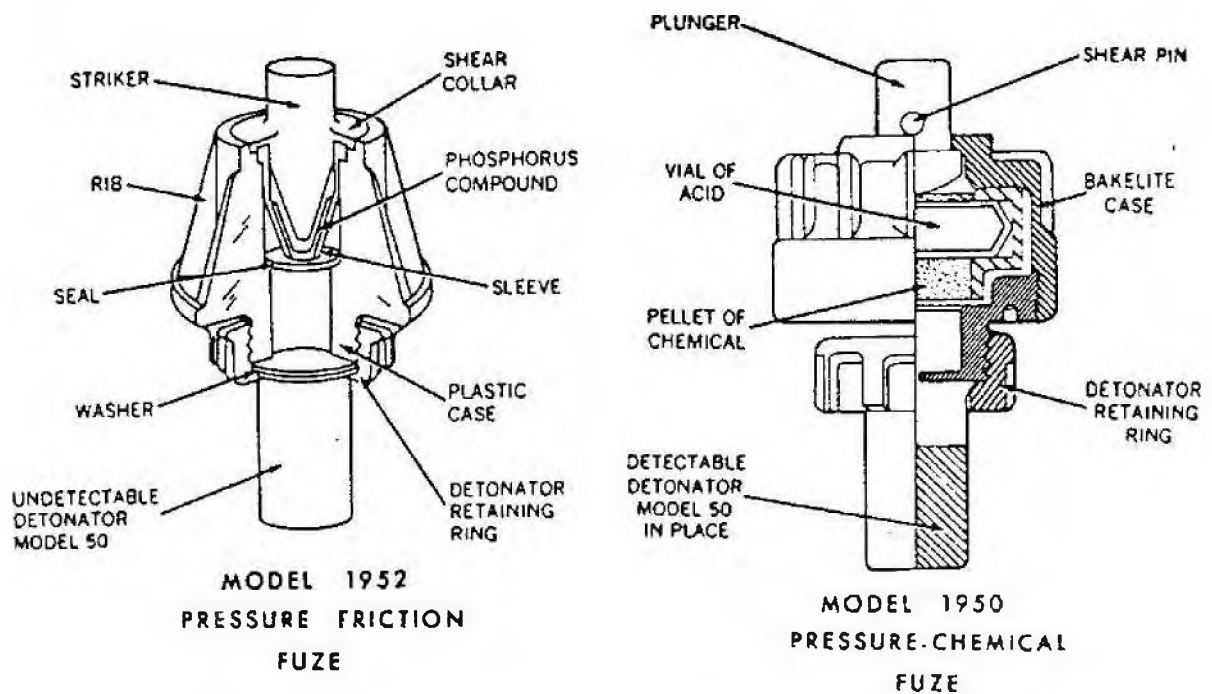


Figure 9-20. Mine, Antitank, Nonmetallic, Model 1947.

a. General. This is a conventional undetectable blast type mine fitted with a pressure-chemical or pressure-friction fuze. It is inclosed in a bakelite case. The fuze well and its screwed-in cover are located in the center of the mine. This mine has two secondary fuze wells. It is easily armed, boobytrapped, and powerful enough to cut or damage the tracks of heavy tanks.

b. Use. This is used as a blast type antitank mine for cutting or damaging the tracks of armored vehicles.

c. Functioning. The pressure plate shears away from the case at the application of about 550 pounds or more pressure and transmits it to the fuze, which then actuates the detonator and fires the mine.

d. Installing and Arming.

- (1) Emplace the mine.
- (2) Unscrew the fuze-well cover.
- (3) Fix the detonator to the fuze (pressure-friction model 1952, or pressure-chemical model 1950).
- (4) Place the fuze in the fuze well.
- (5) Replace the fuze-well cover.

e. Disarming.

- (1) Check for and remove any antilift devices.
- (2) Unscrew the fuze-well cover.
- (3) Remove the fuze and detach the detonator.

9-16. Mine, Antitank, Metallic, Model 1948 (France)

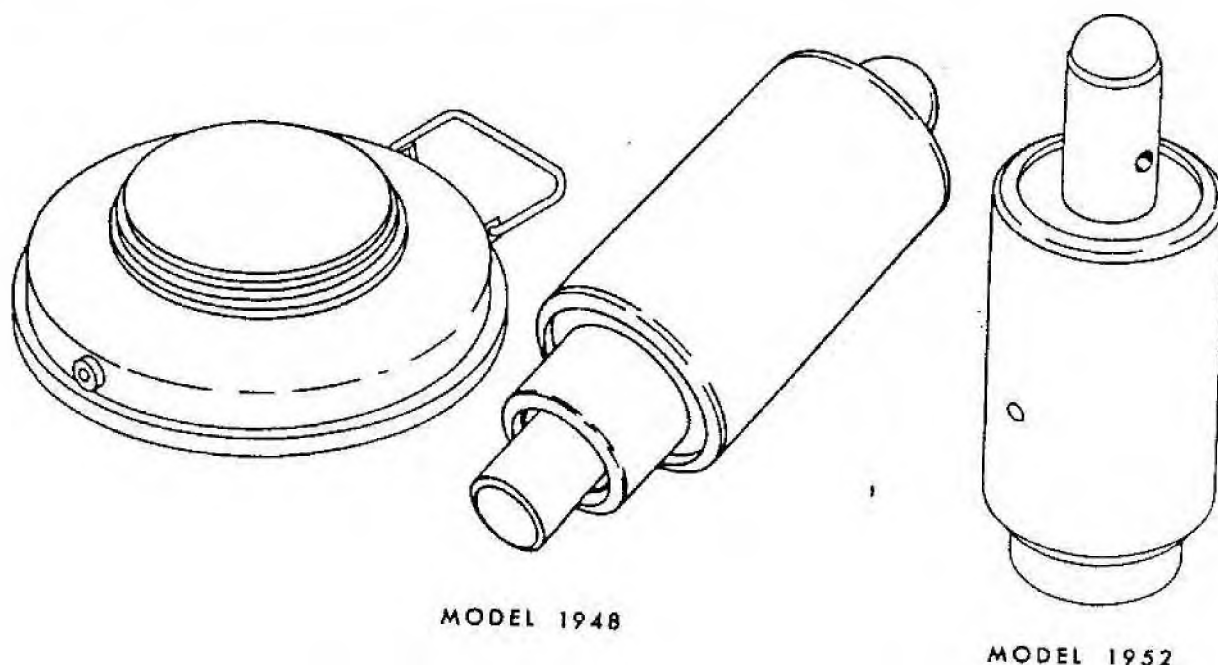


Figure 9-21. Mine, Antitank, Metallic, Model 1948.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12.4" Height: 3.4"	19.8 lb	Model 1948 pressure or Model 1952 pressure/ pressure- release.	330 lb pressure	11.5 lb TNT or MD (20% dinitro- naphthalene, 80% picric acid)	NA

a. General. This steel mine is the French version of the German Tellermine Model 43. It has a large circular pressure plate that completely covers the centrally located main fuze well. There are two secondary fuze wells—one located in the side directly across from the carrying handle, the other in the bottom of the mine case. This mine is a standard item of French mine-warfare equipment.

b. Use. This mine is usually laid in antitank mine fields or roads.

c. Functioning. Pressure on the pressure plate breaks the fuze shear pin (pressure, Model 1948), thus releasing the spring-loaded striker to drive into the detonator. If the Model 1952 antidisturbance fuze is used, the arming pin is sheared when the pressure plate is put in place, after which the fuze functions under pressure or by pressure release on the removal of the pressure plate.

d. Installing and Arming.

- (1) Remove the pressure plate.
- (2) Attach a detonator to the Model 1948 pressure fuze or the Model 1952 antidisturbance fuze.
- (3) Insert the fuze in the well.
- (4) Replace the pressure plate (when the model 1952 antidisturbance fuze is used, turn the pressure plate down until the sound of the snapping of the arming pin is heard.)

e. Disarming. Never attempt to disarm this mine, as it is impossible to determine by inspection the type of fuze that is used. The mine should be destroyed in place.

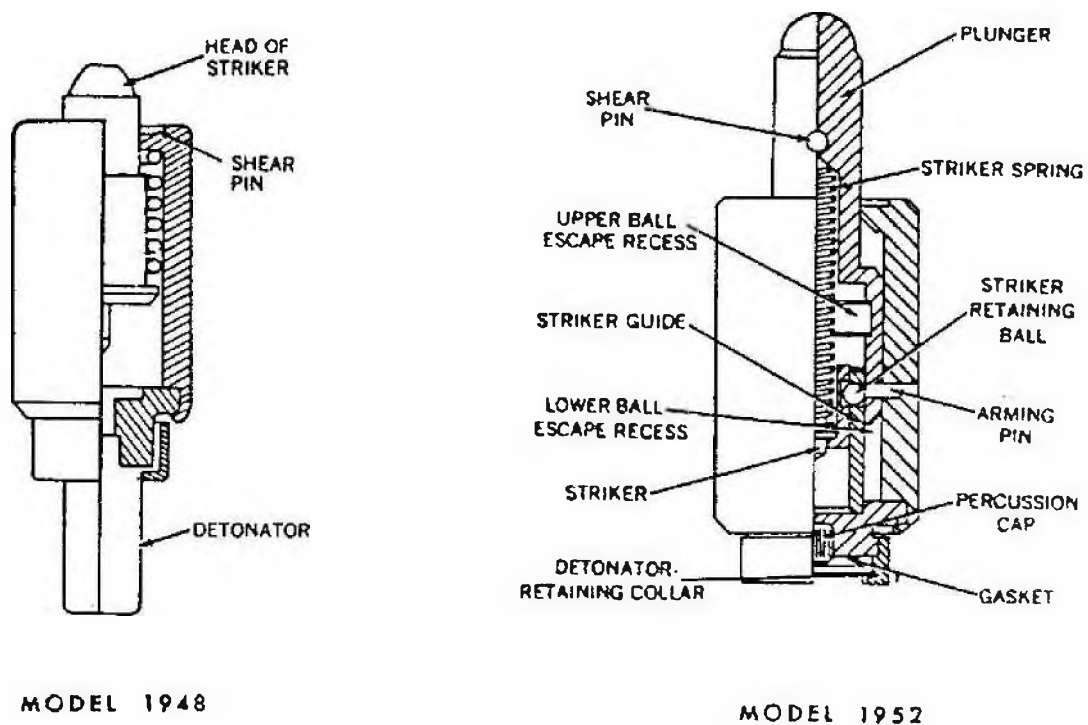


Figure 9-22. Mine, Antitank, Metallic, Model 1948.

9-17. Mine, Antitank, Plate-Charge, Model 1948 (France)

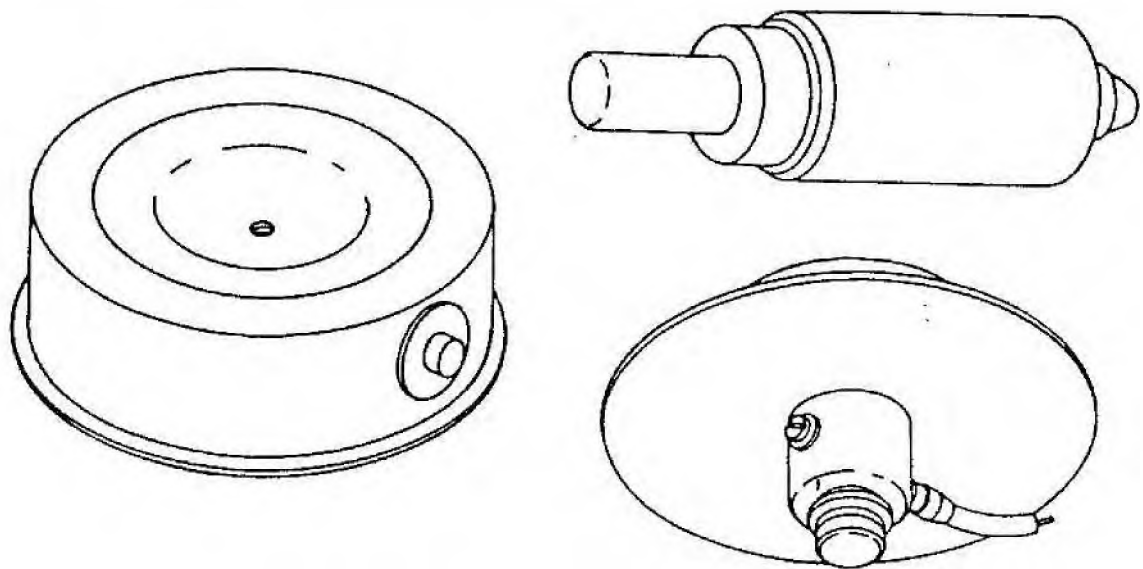


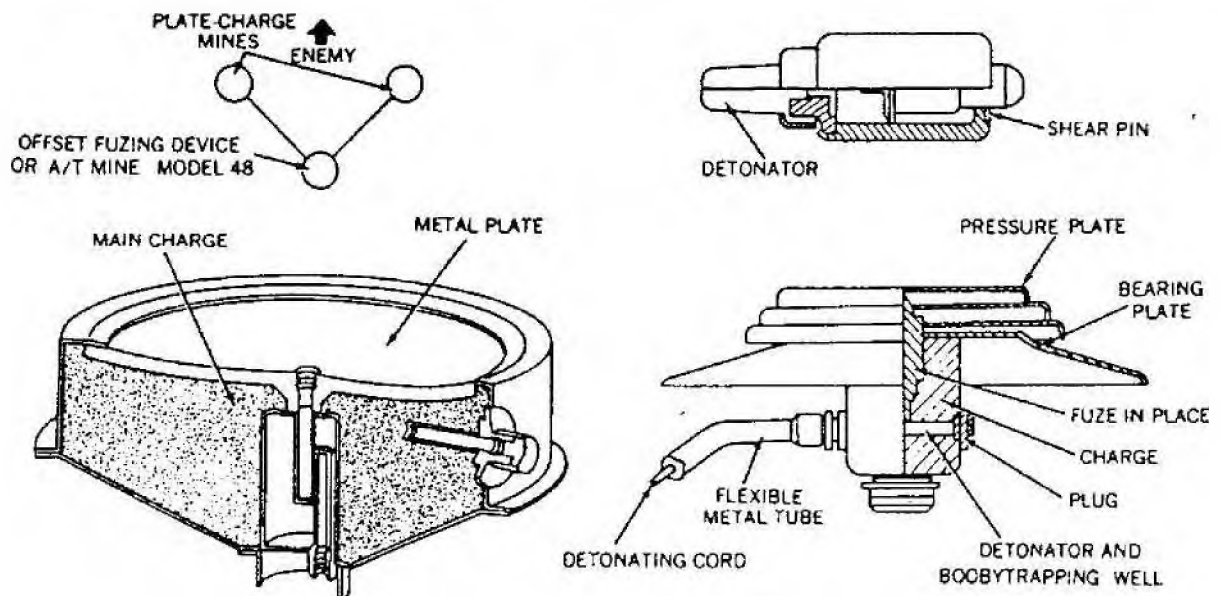
Figure 9-23. Mine Antitank, Plate-Charge, Model 1948.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 10.8" Height: 5.3"		Mech. offset or tilt-rod.	330 lb for offset fuze or metallic antitank mine Model 1948.	TNT or picric acid, 16 lb approx.	Pentolite 0.5 lb.

a. General. This sheet metal unit with its 10-pound metal plate is designed to "kill" and not merely to stop or disable a tank. The device will make a hole about 7.9" in diameter through 1.8"

of armor plate when detonated about 20 inches away.

b. Use. The mine is usually emplaced in pairs, connected to a common metallic offset fuzeing



EMPLOYS MECHANICAL OFFSET OR TILT ROD FUZE

Figure 9-24. Mine, Antitank, Plate-Charge, Model 1948.

device or a Model 1948 metallic antitank mine so that one of them will likely explode underneath the tank. When used singly, the plate-charge mine is fitted with a tilt-rod fuze. (Another version of this mine, Model 1951, has no case, the explosive being reinforced by glass wool. The same charge plate is used, however.)

c. Functioning.

(1) *Offset fuzing.* Pressure transmitted to the fuze through the pressure plate of the offset device or control mine causes the striker retaining pin to fall and the spring-actuated striker to fire the detonator. The detonator fires the charge of the offset device or mine and the firing chain is carried through the detonating cord to the plate-charge detonating cord to the plate-charge mines, which throw the metal plates to penetrate the belly armor of the tank.

(2) *Tilt-rod fuzing.* Lateral pressure on the rod cams down a sleeve with holes in it to allow the striker holding-balls to escape, freeing the striker and initiating the firing chain.

d. Installing and Arming.

(1) *Offset fuzing.*

(a) Place the two mines and the offset fuzing device (or Model 1948 metallic antitank mine) to form a V with the open side toward the enemy and the plate charge mines at the ends.

(b) Attach the metallic hoses containing the detonating cord to the offset device or the central mine.

(c) Remove the pressure plate of the offset device or central mine.

(d) Place a Model 1948 mechanical fuze or

a Model 1952 antidisturbance fuze fitted with a detonator into the well of the offset device or the central mine.

(e) Replace the pressure plate.

(f) Attach the detonating cords to the plate-charge mines after having placed No. 8 blasting caps in the wells to be used.

(g) Boobytrap the mines, if desired.

e. Disarming.

(1) *Offset device.*

(a) Check for and remove any antilift devices.

(b) Cut the detonating cord at the mine.

(c) Destroy the fuzing device in place.

(2) *Concussion-type fuzing.*

(a) Check for and remove any antilift devices.

(b) Cut the detonating cord leads between the mines.

(c) Identify and disarm the firing mine according to disarming instructions.

(d) Remove the blasting caps from the fuze wells.

(3) *Tilt-rod.*

(a) Check for and remove any antilift devices.

(b) Insert a safety wire in the safety pin hole of the fuze if one is present. If no hole is present, screw down the safety cap which will usually be found directly below the base of the rod.

(c) Remove the fuze and detonator assembly.

9-18. Mine, Antitank, Shaped Charge, Models 1953 and 1954 (France)

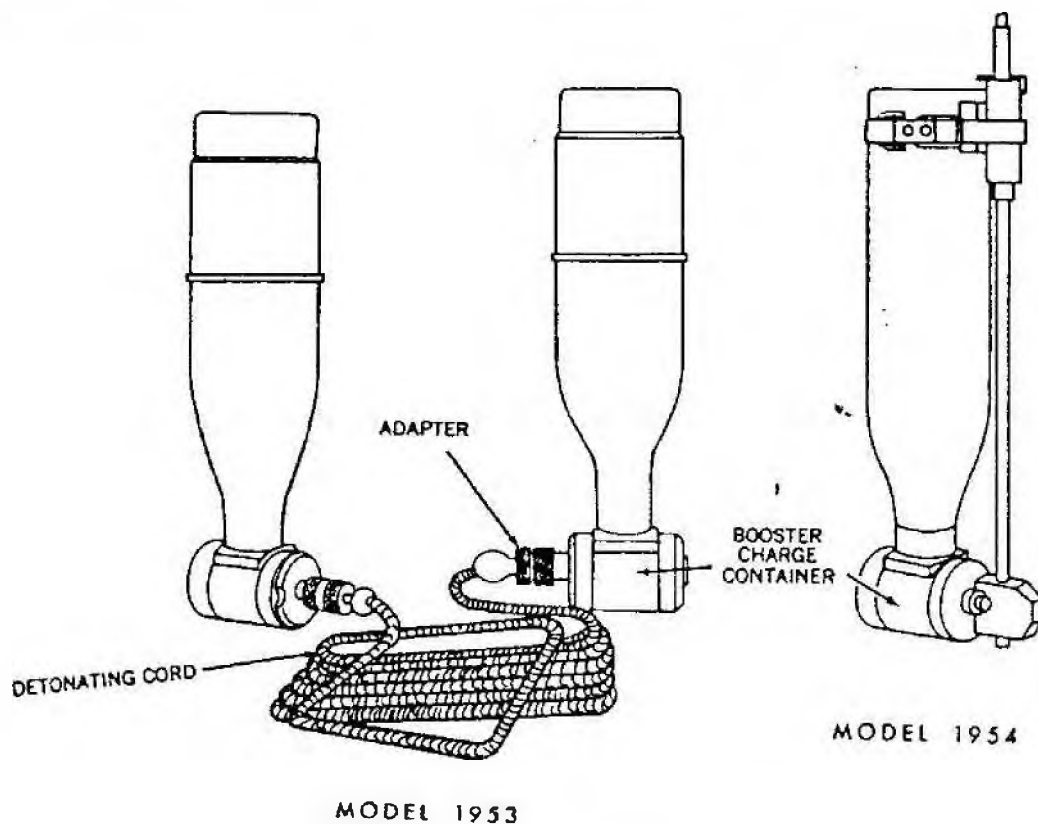


Figure 9-25. Mine, Antitank, Shaped Charge, Models 1953 and 1954.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.8" Height: 10.9"	2 lbs approx.	Offset fuze device, Model 1952 tilt-rod fuze, or "trigger" mine.	Varies	10.6 oz approx.	No data

a. General. These are modified 73mm shaped-charge antitank grenades. Model 1953 is a pair coupled by a detonating cord and fired by an offset device or a "trigger" mine. Model 1954 is a single grenade with a tiltrod fuze. Both models are considered powerful enough to penetrate 4" of armor from a 23" standoff, firing through 2" camouflage cover.

b. Use. Both models are used to penetrate belly plates of armored vehicles.

c. Functioning.

(1) Model 1953. Pressure on the trigger mine or offset fuze device fires it and the detonating cord continues the firing chain to the two shaped-charge mines.

(2) Model 1954. Lateral pressure on the tilt rod actuates the fuze. A 0.5-second delay, built into the fuze chain, increases the probability that the target will be "full over" the mine before it fires.

d. Installing and Arming. (Model 1953).

(1) Lay out and emplace the mines to form a V, with the open part toward the probable route of approach.

(2) Fuze the "trigger" mine or offset device following the instructions given for the model used.

(3) Place the trigger mine at the point of the V.

e. Disarming.

(1) With offset device:

- (a) Check for and remove any antilift devices.
- (b) Cut the detonating cord at the mines.
- (c) Destroy the fuzeing device in place.

(2) With concussion antitank mine fuze:

- (a) Check for and remove any antilift devices.
- (b) Cut the detonating cord leads between the mines.
- (c) Identify and disarm the firing mine as per disarming instructions.

(d) Remove the detonator assembly from the mines.

(e) Transport the mines and fuzes to a safe storage or disposal area.

(3) With tilt rod:

(a) Check for and remove any antilift devices.

(b) Insert a safety wire in the safety pin hole of the fuze if one is present. If no hole is present screw down the safety cap which will usually be located at the base of the tilt rod.

(c) Remove the fuze and detonator assembly.

9-19. Mine, Antitank, Plastic, 1951 "Grille" (France)

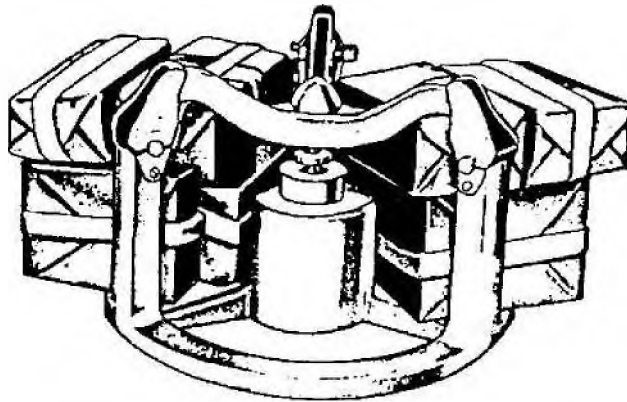


Figure 9-26. Mine, Antitank, Plastic, 1951 "Grille."

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 9.5" Height: 5.9" (frame)	1.8 lb (frame)	Same as Model 1951	No data	11 to 16 lb PETN	No data

a. *General.* Mine has detonator, fuze, and built-in booster in center well, with 1 secondary fuze well in bottom. Blocks of explosive are placed around center well.

b. *Functioning.* Sympathetic detonation sets off main charge.

9-20. Mine, Antipersonnel, Nonmetallic, Model 1951 (France)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.7" Height: 1.9"	3 oz	Integral pressure-friction.	31 to 53 lb.	1 8 oz PETN	NA

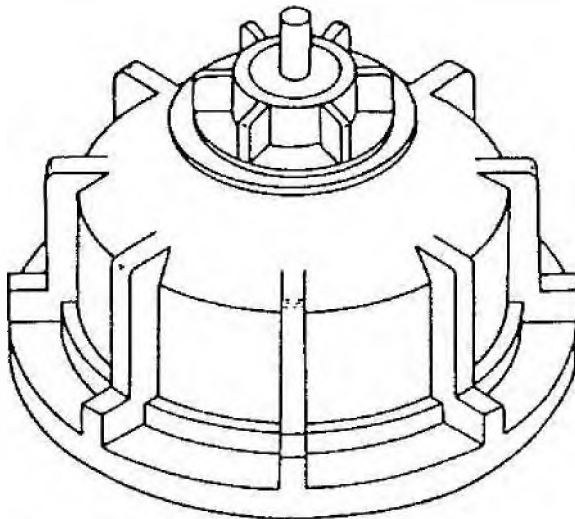


Figure 9-27. Mine, Antipersonnel, Model 1951.

a. General. This is a small plastic concussion type mine with a cylindrical lower part, and a truncated cone top. It has an integral friction fuze.

b. Use. This mine is used in large numbers as a light antipersonnel mine.

c. Functioning. Pressure put on top of the firing pin causes its shear collar to fail. The firing pin, charged with a friction compound of red phosphorous and glass, is abraded when its tapered end slides against a mating sleeve, producing a flame that fires the detonator and explodes the main charge.

d. Installing and Arming.

- (1) Unscrew the fuze assembly.
- (2) Place detonator (Model 1950 undetectable) in the well.
- (3) Replace the fuze assembly.
- (4) Bury the mine with just the top above the ground.

e. Disarming. Remove the fuze assembly and the detonator.

f. Precaution. The pressure piece on this mine has a protrusion long enough to be broken off by a sidewise force.

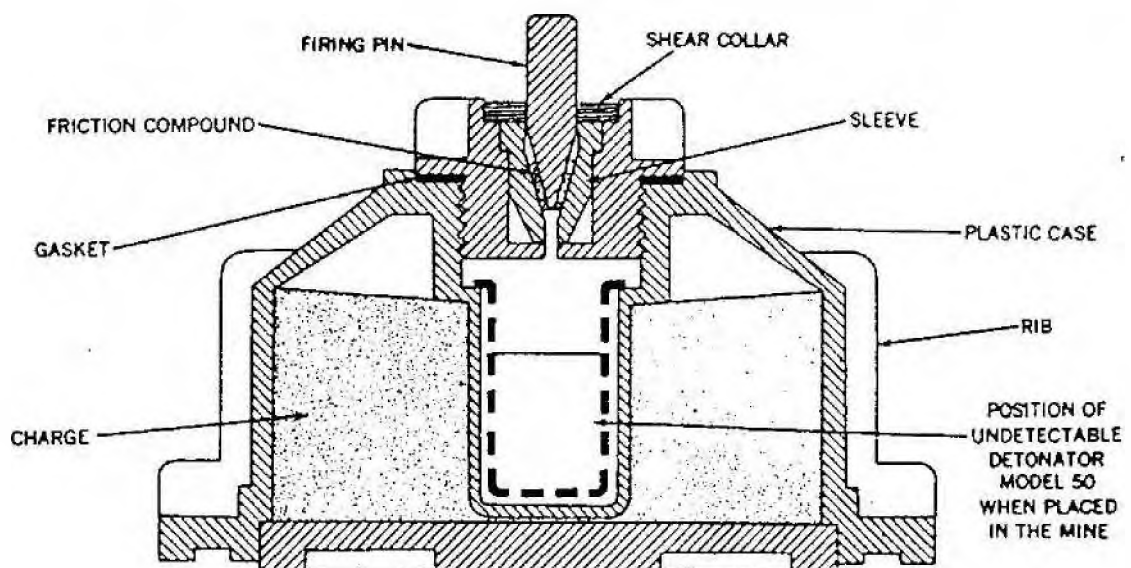


Figure 9-28. Mine, Antipersonnel, Nonmetallic, Model 1951.

9-21. Mine, Antipersonnel, Nonmetallic, Model 1948 (France)

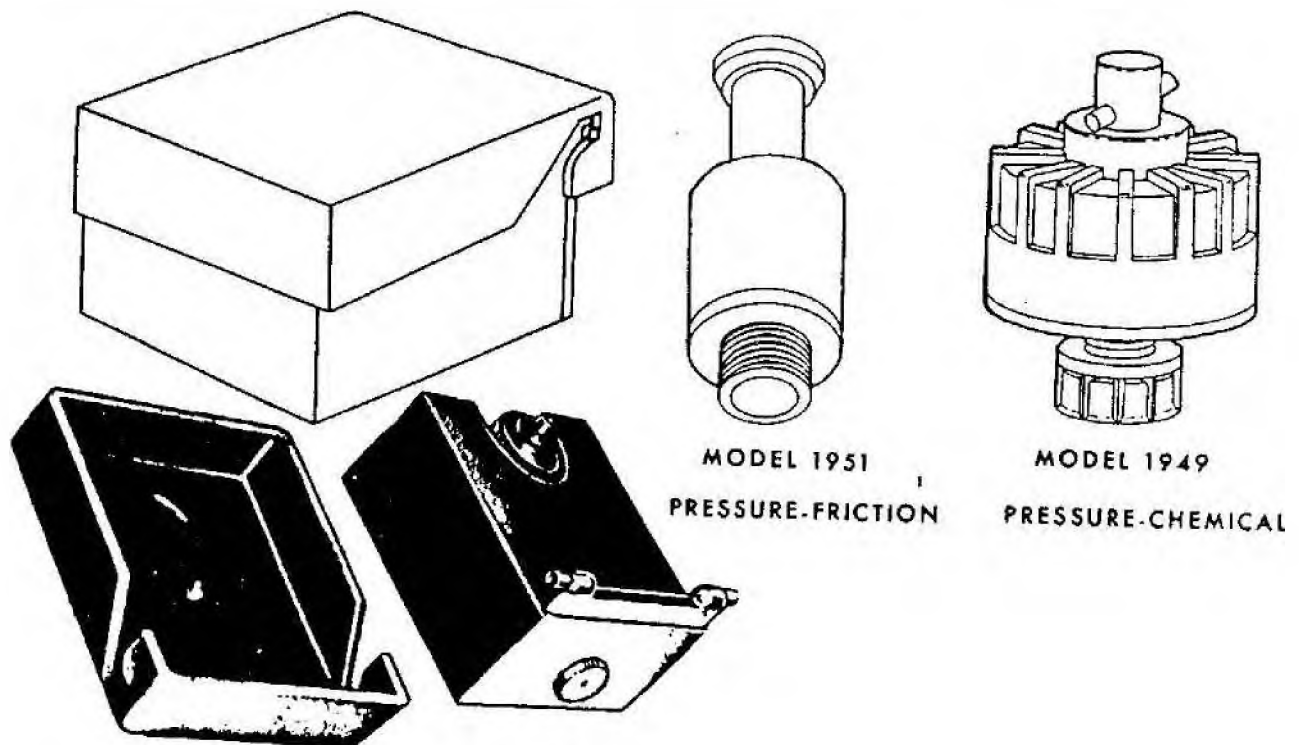


Figure 9-29. Mine, Antipersonnel, Nonmetallic, Model 1948.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 4.2" Width: 3.9" Height: 2.5"	20.8 oz	Model 1949 Pressure-chemical, or Model 1951 Pressure-friction.	48.5 lb approx.	6.0 oz ammonium nitrate or 5.9 oz TNT	None

a. General. This is a small Schü type mine in a bituminous material case, not locatable by electronic detectors. It has a hinged lid, with a detonator well fitted with a screw plug at one end and a fuze well at the other. It is designed to wound rather than kill (can blow off a foot), having a light explosive charge and a relatively low shrapnel effect.

b. Use. It is used to wound and not kill foot soldiers.

c. Functioning. The weight of a man on the mine rotates the lid about the hinge pins and applies pressure to the fuze, causing it to function and fire the detonator and the main charge.

d. Installing and Arming.

(1) Remove the lid.

(2) Remove the fuze well cover and screw the fuze (Model 1951 pressure-friction or Model 1949 pressure-chemical) into the well.

(3) Unscrew the detonator well plug.

(4) Place the detonator (Model 1949 undetectable) in the well and replace the cover.

(5) Replace the lid, being careful to keep the fuze free of pressure.

(6) Bury the mine, lid uppermost, and cover it with a thin camouflage layer.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Remove the lid, being careful not to place any pressure on it.

(3) Unscrew the detonator well plug.
(4) Lift out the detonator.

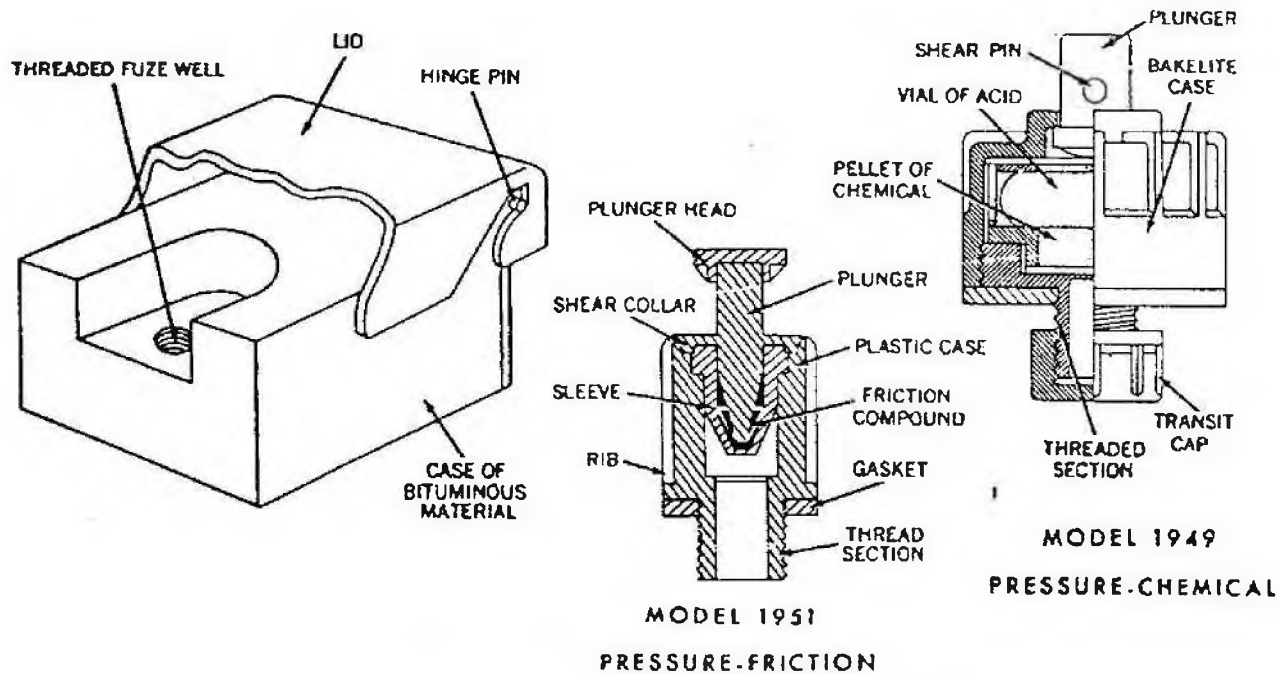
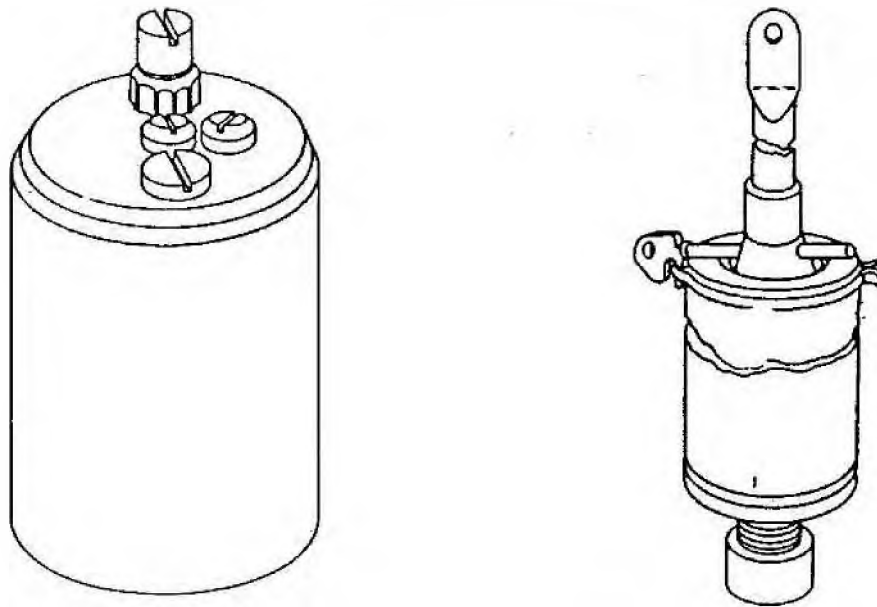


Figure 9-30. Mine, Antipersonnel, Nonmetallic, Model 1948.

9-22. Mine, Antipersonnel, Bounding, Model 1951/55 (France)



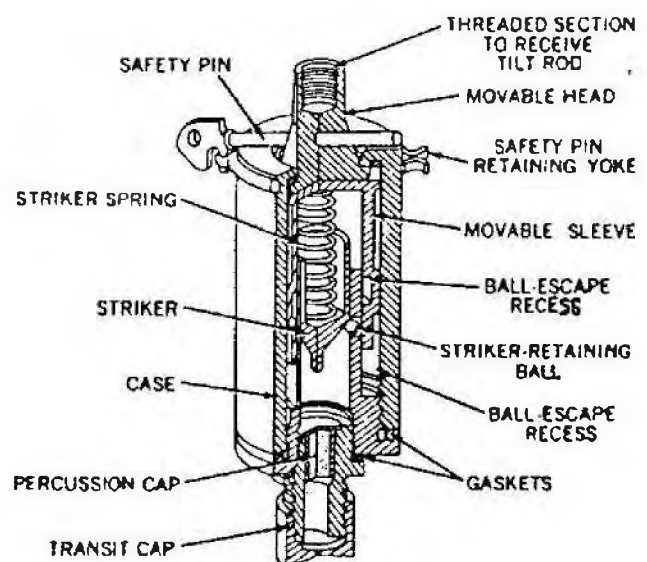
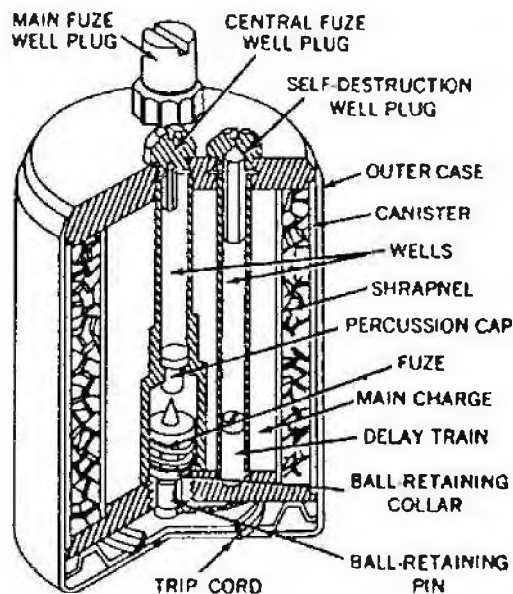
FUZE TILT ROD MODEL 1952

Figure 9-51. Mine, Antipersonnel, Bounding, Model 1951/55.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.8" Height: 6.2"	9.9 lb	Model 1952 tilt-rod	6.6 lb or more	14.4 oz picric acid.	No data

a. General. This device resembles the World War II German "S" mine. It has a metal case that acts as a mortar and a canister that contains the

main charge, the integral fuze, and steel shrapnel. The mine has a delay mechanism to detonate the main charge, even if the propelling charge fuze or



FUZE TILT ROD MODEL 1952

Figure 9-52. Mine, Antipersonnel, Bounding, Model 1951/55.

the canister fuze does not function. The lid contains a main, a central, and a self destruction fuze-well plug.

b. Use. This mine is used in minefields and for defense and nuisance purposes.

c. Functioning. A tilt of the rod, a pull on the tripwire, or pressure downward on the rod actuates the fuze, firing the delay train and propelling charge. The expanding gases of the propelling charge project the canister into the air. When a cord attached to the bottom of the outer case and the integral fuze has reached its full length, it pulls out the ball retaining pin of the canister fuze. The removal of this pin releases the striker retaining balls which escape and free the spring-driven striker, which initiates the firing chain that consists of a percussion cap, a detonator, and a main charge. When the main charge is fired, at approximately 1.5 meters height, it hurls the shrapnel in all directions up to a radius of 45 meters.

d. Installing and Arming.

(1) Remove the plugs from the central, the self-destruction, and the main fuze-wells. (Do not remove plug from filler well.)

(2) Place a No. 8 blasting cap, open end down, in the self-destruction and the central fuze-wells.

(3) Replace the center and self-destruction fuze-well plugs.

(4) Screw the fuze (tilt-rod Model 1952) in the main fuze-well.

(5) Emplace the mine with its top flush with the surface of the ground.

(6) Fasten the trip wire to its anchor and then to the fuze.

(7) After insuring that there is no tension on the trip wire, remove the safety pin.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Trace and cut the tripwire.

(3) Replace the safety pin in the fuze and lift the mine.

(4) Remove the fuze.

(5) Remove the plugs from the central fuze and self destruction fuze-wells.

(6) Remove the blasting caps.

9-23. Mine, Antipersonnel, Model 59 "Inkstand" (France)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.4" Height: 1.4"	No data	NM SAE 59 Pressure friction.	No data	2 oz TNT	0.6 oz Teteryl

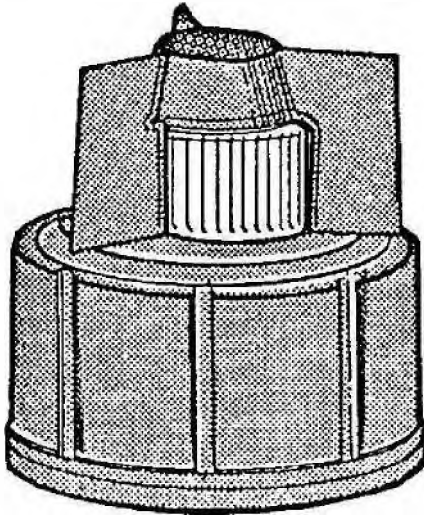


Figure 9-33. Mine, Antipersonnel, Model 59 "Inkstand."

a. *General.* The mine was developed to replace the M51 antipersonnel mine. This mine has a plastic case. It has a metal detection plate, attached to the body of the mine, which can be left in place to enable easy detection of the mine when it is used for temporary protection.

b. *Installing and Arming.* Unscrew fuze from mine. Insert detonator (SAE M156 or R54) into mine. (Remove metal detection plate). Screw fuze into mine. Bury mine with top of fuze slightly above ground level. Remove safety cap.

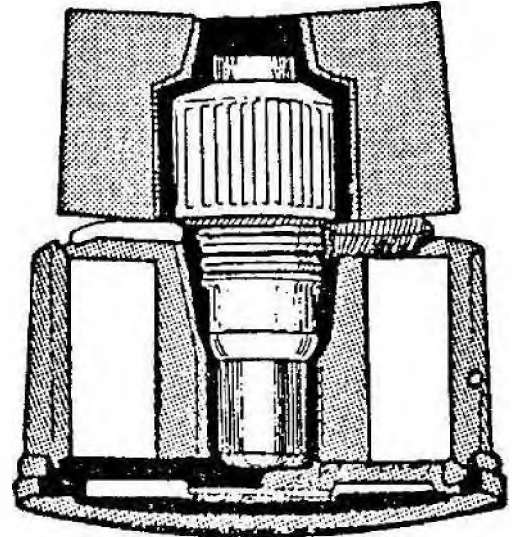


Figure 9-34. Mine, Antipersonnel, Model 59 "Inkstand."

9-24. Mine, Antipersonnel, Claymore Type (France)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Square: 12.4" x 12.4" Height: 4.8" approx.	47.8 lb	No data	No data	22 lb melinite	None

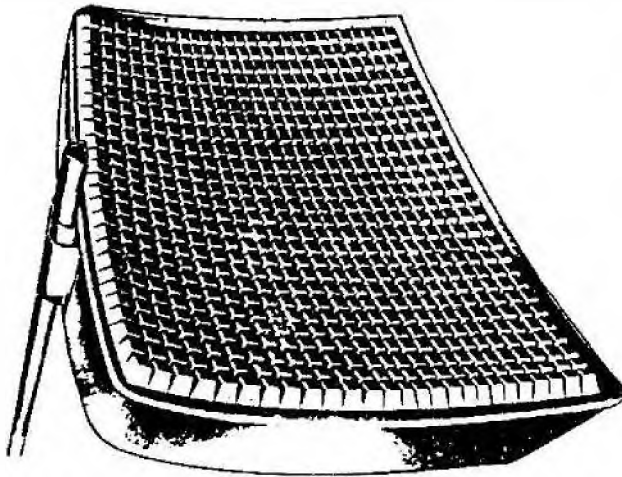


Figure 9-35. Mine, Antipersonnel, Claymore Type.

General. Mine has 0.02" sheet steel case and 1 fuze well. Upon firing, 530 serrated (toothed) fragments (0.5" x 0.6") are scattered for a maximum range of 200 meters.

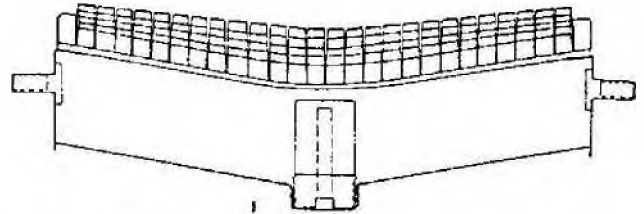


Figure 9-36. Mine, Antipersonnel, Claymore Type.

9-25. Mine, Antipersonnel, DV56, Nonmetallic Model 1956 (France)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.8" Height: 3.1"	5.7 oz	Friction-pressure.	No data	2.8 oz Tolute	0.5 oz Teteryl

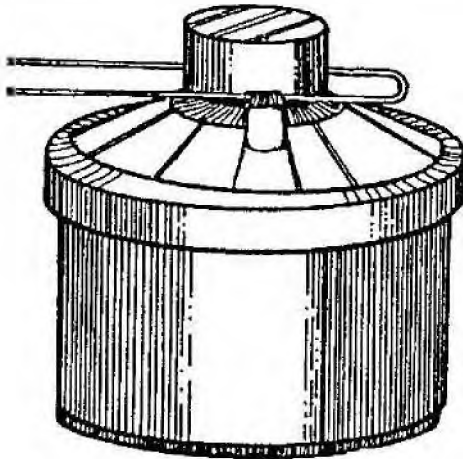


Figure 9-37. Mine, Antipersonnel, DV56, Nonmetallic Model 1956.

a. *General.* This blast type mine has a cylindrical body made of plastic that is flexible and water-tight. Mine is detectable, if desired, by means of a removable metallic plate. It has a fork safety device. Fuze well is located at the top. There is a central detonator well opening on the lower side of the mine.

b. *Functioning.* Pressure igniting fuze is oper-

ated by friction of an inflammable paste. Head of fuze is kept immobile by safety device equipped with nylon string.

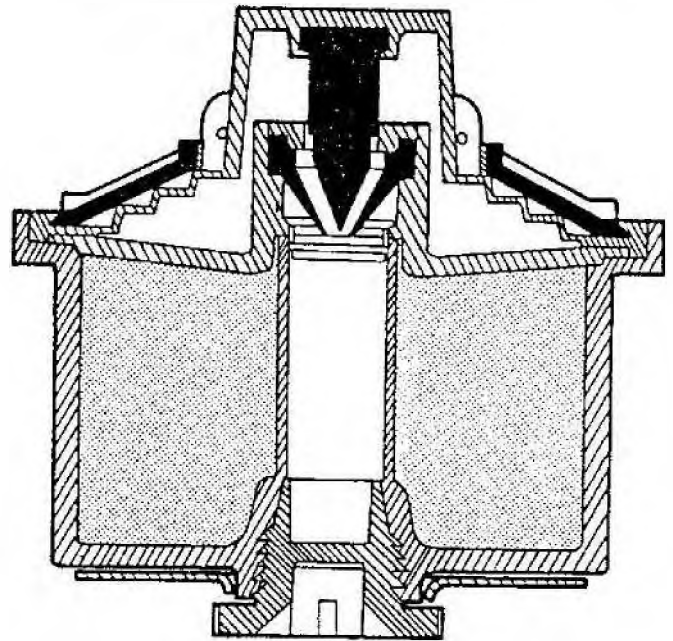


Figure 9-38. Mine, Antipersonnel, DV56, Nonmetallic Model 1956.

9-26. Fuze, Pressure-Friction, Model 1952 (France)

Dimensions	Case	Internal action	Operating force
Diameter: 1" Length: 1.9"	Plastic	Pressure-friction with shear collar release	33 lb

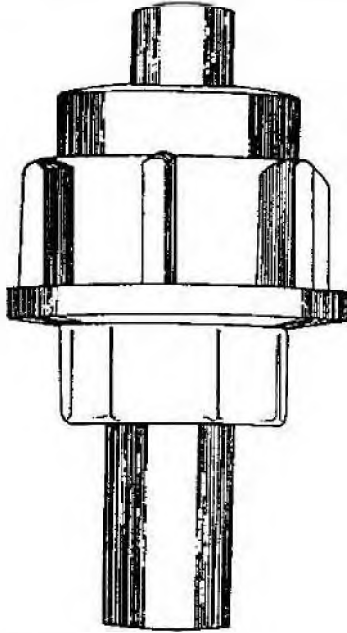


Figure 9-39. Fuze, Pressure-Friction, Model 1952.

a. General. This cylindrical fuze, is designed for igniting undetectable mines. The case is reinforced with wedge-shaped external ribs. The fuze is simple in construction and functioning. The lower part of the case is in the form of a ribbed collar threaded to the base of the main body for attaching the detonator. The striker is held in

place and supported by a plastic shear collar. The upper portion of the striker extends above the fuze case; the lower portion is tapered to fit into a mating sleeve.

b. Use. This fuze is used in a variety of mines—the antitank Models 1947, 1951, and 1951 probe-proof—and the undetectable offset fuzing device generally used with the Model 1951 undetectable shaped-charge antitank mine.

c. Functioning. Adequate pressure on the top of the plunger of the fuze shears the plastic retaining collar causing the plastic cone-shaped end of the plunger to move against the mating sleeve, which is charged with a phosphorous and glass mixture. This movement (about .08" or less) causes enough friction to fire the mixture and set off the detonator.

d. Installing and Arming.

- (1) Unscrew the detonator retaining ring.
- (2) Insert the detonator (undetectable Model 1950).
- (3) Screw the detonator and retaining ring back on the base of the fuze.

e. Disarming. Unscrew the detonator retaining ring from the back of the fuze and remove the detonator.

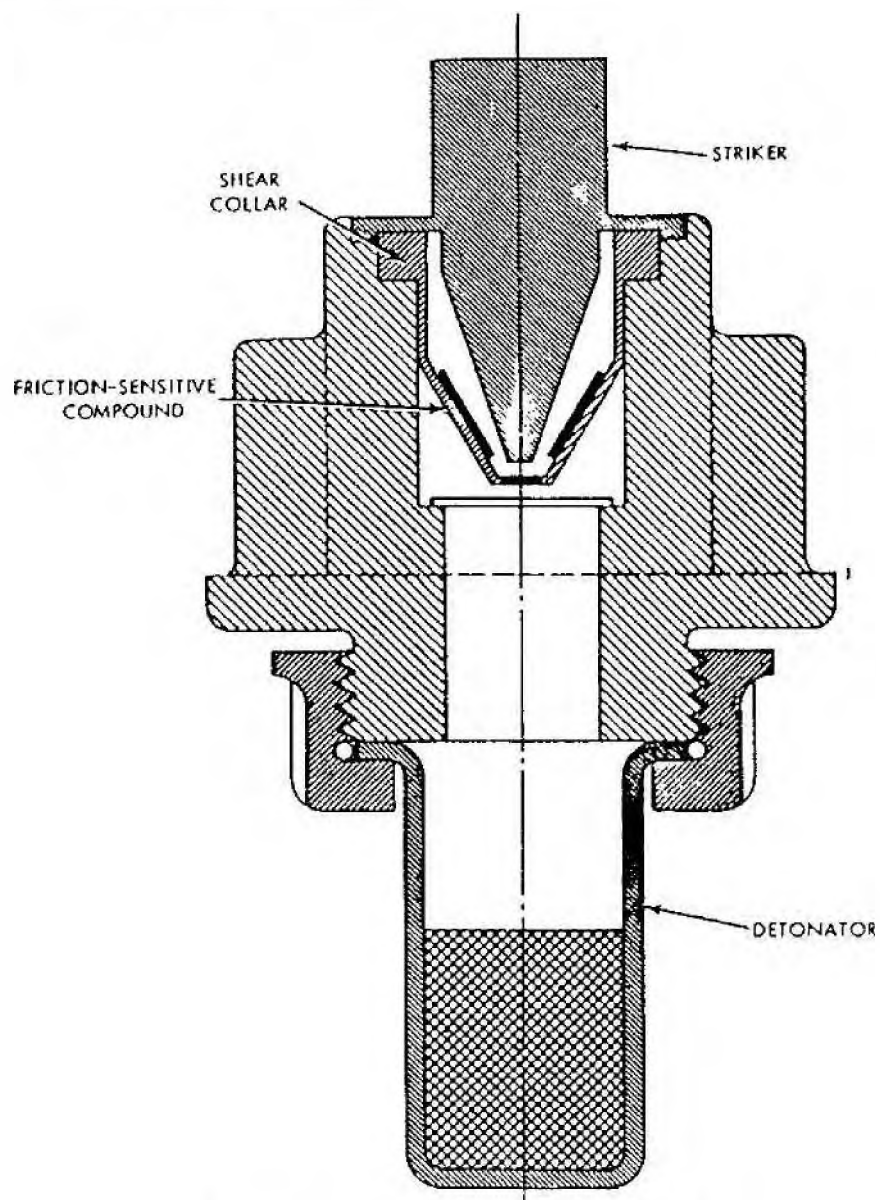


Figure 9-40. Fuze, Pressure-Friction, Model 1952.

9-27. Fuze, Pressure-Chemical, Model 1950 (France)

Dimensions	Case	Internal action	Operating force
Diameter: 1.1" Height: 2"	Bakelite	Pressure-chemical, with shear pin release.	77 lb.

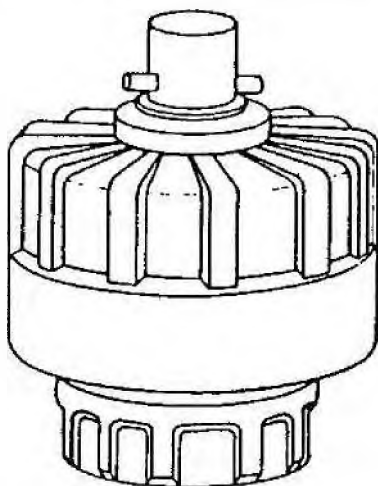


Figure 9-41. Fuze, Pressure-Chemical, Model 1950.

a. General. This device consists of a plunger, detonator retaining ring, vial of acid, and a chemical pellet enclosed in a bakelite case. The case is strengthened on the outside by the addition of vertical ribs; the lower portion is threaded to accommodate the detonator retaining ring. The plunger, held in place by a shear pin, rests on the vial. This fuze has no metallic parts.

b. Use. This fuze is used with the Model 1947, Model 1951, Model 1951 probe-proof, and Model 1951 undetectable shaped-charge antitank mines.

c. Functioning. When adequate pressure is exerted on the head of the plunger, the shear pin fails, and the plunger, forced downward, crushes the vial of acid. The acid, mixing with the chemical, causes a flash that sets off the detonator.

d. Installing and Arming.

- (1) Remove the detonator retaining ring.
- (2) Insert the detonator (Model 1950, undetectable).
- (3) Replace the detonator retaining ring.
- (4) Place the fuze in the well of the mine.

e. Disarming.

- (1) Remove the fuze from the fuze well of the mine.
- (2) Unscrew the detonator retaining ring and separate the detonator from the fuze.

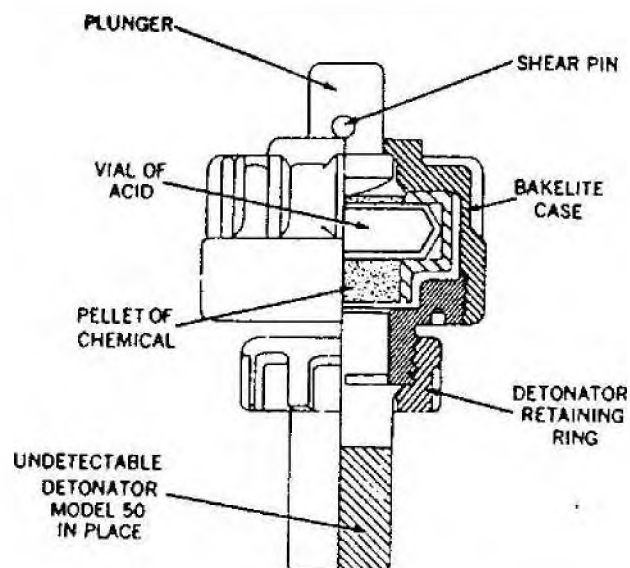


Figure 9-42. Fuze, Pressure-Chemical, Model 1950.

9-28. Fuze, Pull, Model 1951 (France)

Dimensions	Case	Internal action	Operating force
Diameter: 0.5" Height: 2.7"	Metal	Mechanical, with pin and ball release.	2.6 to 7.7 lbs

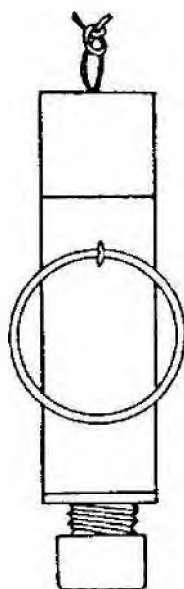


Figure 9-43. Fuze, Pull, Model 1951.

a. General. This spring-actuated ball-retained striker device is in a metal case, the lower end of which is threaded and protected by a transit cap. The two retaining balls are held in place by a pin fitted into the hollow upper end of the striker. This pin, with its pull cord, is held in position by

a coiled spring and drilled to receive the safety pin that passes through it and the case.

b. Use. It is used primarily for boobytrapping metallic antitank mines and for fuzeing the Model 1952 trip flare.

c. Functioning. When adequate traction is applied to the pull cord, it compresses the resistance spring and withdraws the pin from the interior of the striker, which permits the displacement of the retaining balls and the slamming down of the striker on the percussion cap.

d. Installing and Arming.

(1) Place the appropriate detonator in the boobytrapping well of the mine or in the fuze well of the flare.

(2) Remove the transit cap from the fuze.

(3) Screw the fuze into the mine or flare.

(4) Anchor the pull cord.

(5) Fasten the pull cord to the fuze.

(6) Remove the safety pin.

e. Disarming.

(1) Insert the safety pin.

(2) Cut the slack tripwire.

(3) Unscrew the fuze from the mine.

(4) Remove the detonator from the fuze well.

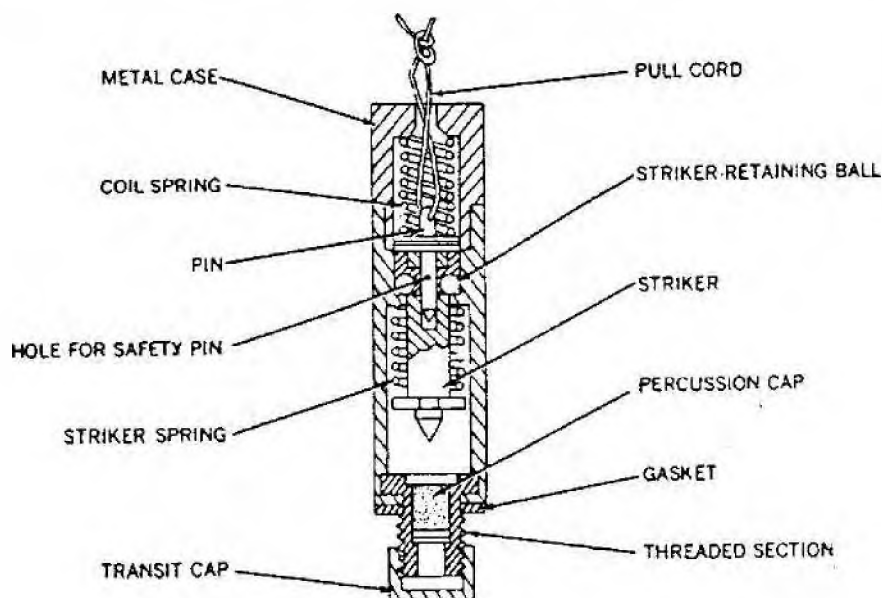


Figure 9-44. Fuze, Pull, Model 1951.

9-29. Fuze, Offset Fuzing Device, Nonmetallic (France)

Dimensions	Case	Internal action	Operating force
Diameter: 8.1" Height: 4.2"	2 lbs approx.	Model 1952 pressure-friction or Model 1950 pressure- chemical.	No data

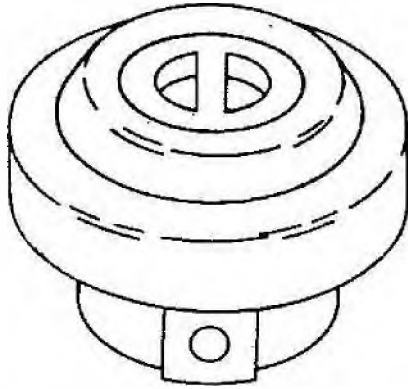


Figure 9-45. Fuze, Offset Fuzing Device, Nonmetallic.

a. *General.* This apparatus consists of a circular bakelite case larger in diameter at the top than the bottom, and a centrally located fuze well with plug surrounded by a shear groove. The lower section of the device—it contains the charge—has two threaded wells to receive the ends of the detonating cord tubes.

b. *Use.* Used to activate groups of undetectable shaped-charge antitank mines.

c. *Functioning.* Pressure on the top shears the pressure plate and activates the fuze, firing the detonator and in turn the main charge. This sets off the detonating cord, which fires the mines.

d. Installing and Arming.

- (1) Remove the fuze well cover.
- (2) Attach a detonator to the fuze.
- (3) Insert the fuze and detonator assembly in the well.
- (4) Replace the fuze well cover (never interchange the covers of the devices).
- (5) Attach the tubes containing the detonating cord to the device and the mines.

e. Disarming.

- (1) Check for and remove any antilift devices.
- (2) Remove the tubes containing the detonating cord from the device.
- (3) Remove the fuze well cover.
- (4) Take out the fuze and detonator assembly.
- (5) Separate the detonator from the fuze.

f. *Precaution.* If possible destroy in place.

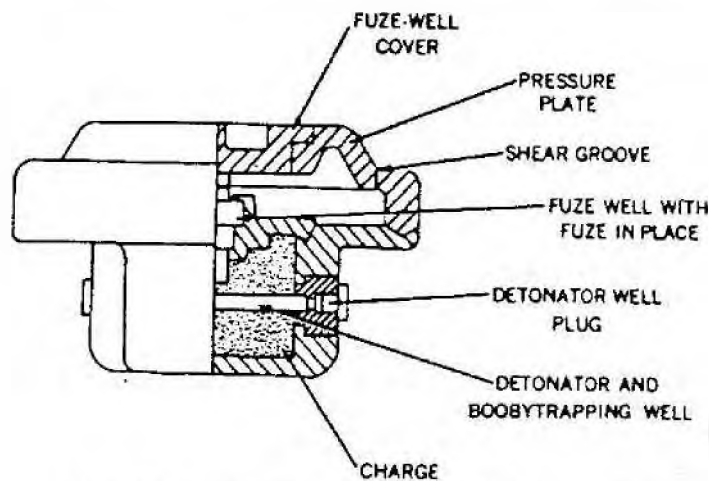


Figure 9-46. Fuze, Offset Fuzing Device, Nonmetallic.

9-30. Fuze, Offset Fuzing Device, Metallic (France)

Dimensions	Weight	Fuze	Operating force
Diameter: 11.7" Height: 5"	4 lbs approx	Model 1948 pressure-mechanical or Model 1952 pressure/pressure release.	330 lbs approx.

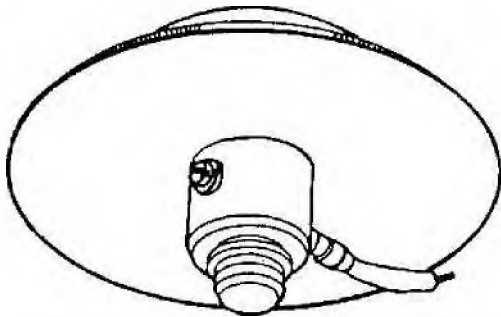


Figure 9-47. Fuze, Offset Fuzing Device, Metallic.

a. General. This device consists of a cylindrical metal case containing a charge, a collar around the upper portion of the case to serve as a bearing plate, and a pressure plate. The detonator well is closed by two plugs screwed into the case. The threaded section of the well accommodates the flexible tubes that house the detonating cord.

b. Use. This is used as an offset fuzing device to initiate antitank plate-charge or shaped charge mines.

c. Functioning. Force applied to the top of the plate causes the Model 1948 pressure fuze or the Model 1952 antidisturbance fuze to function. The

removal of the pressure plate also will cause the Model 1952 fuze to function. The firing of the fuze sets off the charge in the offset device, which is carried forward by the detonating cord encased in a flexible metal tube.

d. Installing and Arming.

- (1) Unscrew the pressure plate.
- (2) Attach the detonator to the fuze (Model 1948 or 1952).
- (3) Place the fuze in the fuze well.
- (4) Replace the pressure plate. (When the Model 1952 antidisturbance fuze is used, the pressure plate should be screwed down until the click of the breaking arming pin is heard.)
- (5) Attach the metallic tubes containing the detonating cord to the mines.
- (6) Boobytrap, if desired.

e. Disarming. This offset fuzing device cannot be disarmed. It should be destroyed in place. It is impossible to tell by inspection whether or not the antidisturbance fuze has been used. (If possible cut the detonating cord lead between the device and the mines, disarm and remove the mines before destroying the fuzing device.)

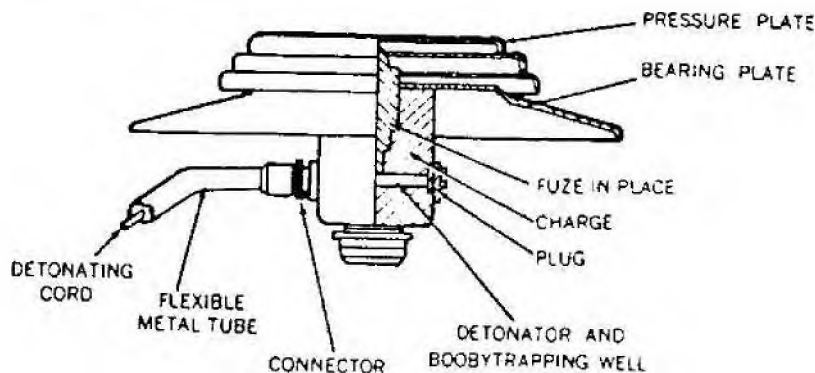


Figure 9-48. Fuze, Offset Fuzing Device, Metallic.

9-31. Fuze, Pressure-Friction, Model 1951 (France)

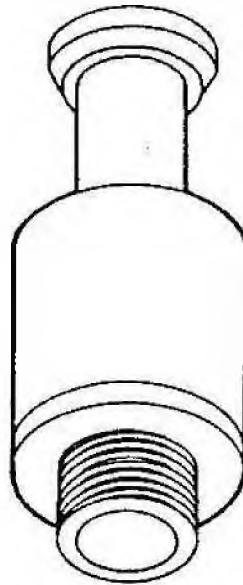


Figure 9-49. Fuze, Pressure-Friction, Model 1951.

Dimensions	Case	Internal action	Operating force
Diameter: 0.7" Height: 1.4"	Plastic	Pressure-friction, with shear collar release.	11 lbs.

a. *General.* The case of this fuze is made of plastic and strengthened with vertical ribs. The threaded lower part is smaller in diameter than the main part. The plunger is supported and held in place by a shear collar. The cone-shaped end of the plunger fits into a mating sleeve charged with a friction compound.

b. *Use.* This unit is designed for detonating the Model 1948 antipersonnel mine.

c. *Functioning.* A pressure of sufficient weight applied on top of the plunger breaks the shear collar and forces its cone shaped end into the mating sleeve. The resulting friction causes a flash that sets off the detonator.

d. *Installing and Arming.*

(1) Place a Model 1949 undetectable detonator or a No. 8 blasting cap into the detonator well of the mine.

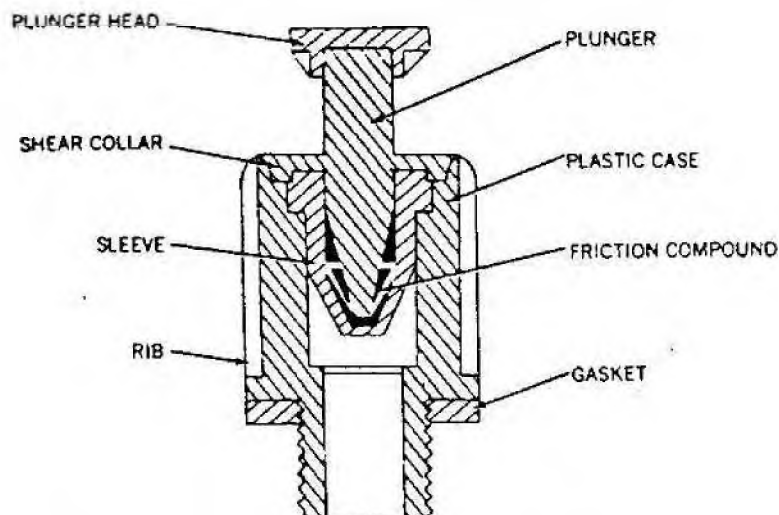


Figure 9-50. Fuze, Pressure-Friction, Model 1951.

(2) Screw a fuze into the fuze well, being careful not to exert pressure on the plunger.
e. Disarming.

(1) Unscrew the fuze from the fuze well.
(2) Remove the detonator from the well of the mine.

9-32. Fuze, Tilt-Rod, Model 1952 (France)

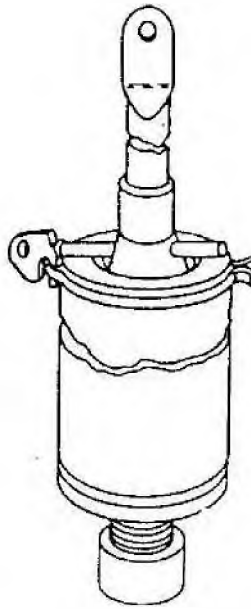


Figure 9-51. Fuze, Tilt-Rod, Model 1952.

Dimensions	Case	Internal action	Operating force
Diameter: 0.9" Height: w/tiltrod: 5.1" Height: w/o tiltrod: 2.7"	Metal	Mechanical with tiltrod ball release.	22 lbs vertically

a. *General.* This metallic cased fuze is threaded at the base and protected by a transit cap. The movable head projects from the upper end. The tilt rod, which has a hole near the top for fastening the tripwire, is screwed into the movable

head. A safety pin is located at the junction of the head and the fuze body. The safety is held in position by a yoke that passes around the fuze body. The spring-loaded striker is kept in place by two retaining balls.

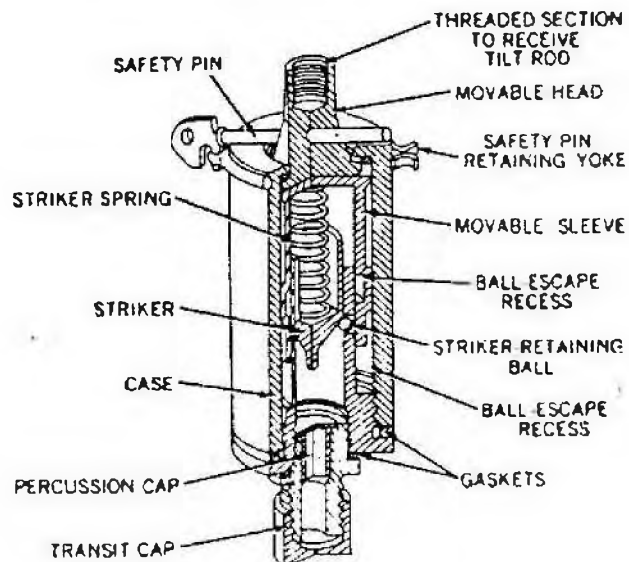


Figure 9-52. Fuze, Tilt-Rod, Model 1952.

b. Use. The fuze, fitted with a short tilt rod or a 3-pronged head for pressure actuation, is used with the Model 1951 bounding shrapnel antipersonnel mine and Model 1950 trip flare. It is fitted with a long tilt rod for use with the Model 1948 plate-charge antitank mine.

c. Functioning. A lateral force on the tilt rod causes the movable head to cam down the sleeve. When the sleeve has moved downward far enough, the holes in the sleeve align with and release the retaining balls, freeing the spring-driven striker which initiates the percussion cap. The fuze also functions by a straight downward pressure applied to the top of the tilt rod.

d. Installing and Arming.

(1) Install a detonator in the mine, if required.

(2) Remove the transit cap and place the fuze in the mine.

(3) Attach the short tilt rod and arrange and fasten the pull wire. The long tilt rod may be used (usually without a pull wire).

(4) Remove the safety pin retaining yoke and the safety pin.

e. Disarming.

(1) Put a safety pin in the safety pin hole.

(2) Remove the fuze from the mine.

(3) Remove the detonator from the mine.

9-33. Fuze, Pressure-Chemical, Model 1949 (France)

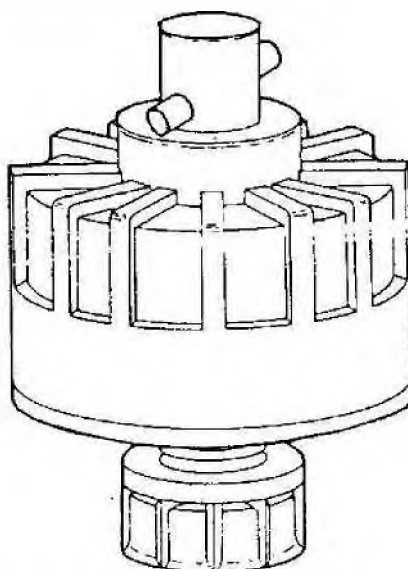


Figure 9-53. Fuze, Pressure-Chemical, Model 1949.

Dimensions	Case	Internal action	Operating force
Diameter: 1.1" Height: 1.5"	Bakelite	Pressure-chemical, with shear pin.	44 lb

a. General. This is essentially a cylindrical case containing a vial of acid, a chemical pellet, and a plunger that rests on the vial and extends above the case. The lower threaded portion of the case is protected by a transit cap. This fuze is not detectable by ordinary electronic devices, as it is constructed entirely of nonmetallic materials.

b. Use. It is used in the Model 1948 undetectable antipersonnel mine and in improvised mines.

c. Functioning. Pressure on the top of the plunger causes the failure of the shear pin and forces the plunger down, breaking the vial of acid. The acid, mixing with the chemical, produces a flash that explodes the detonator.

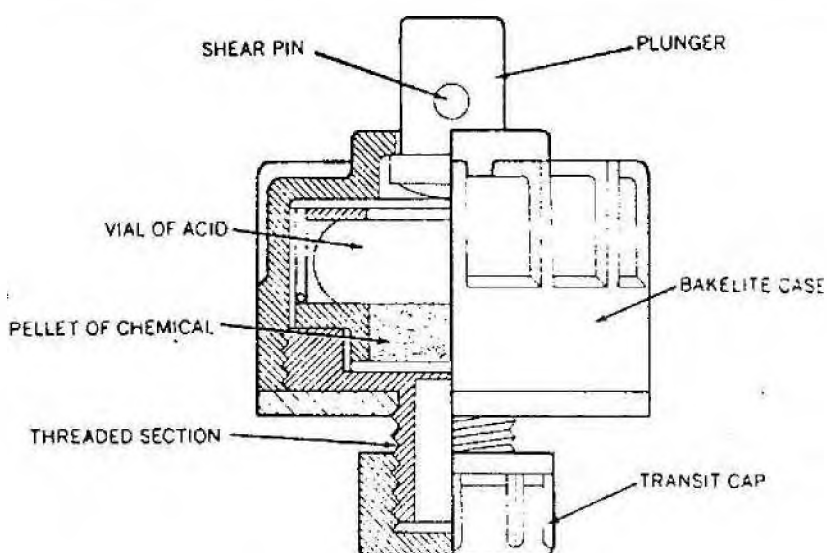


Figure 9-54. Fuze, Pressure-Chemical, Model 1949.

d. Installing and Arming.

(1) Unscrew the transit cap from the base of the fuze.

(2) Place a Model 1950 detonator (or a No. 8 blasting cap) in the mine.

(3) Insert the fuze without putting pressure on the top of the plunger.

e. Disarming.

(1) Remove the fuze from the mine without putting any pressure on the top of the plunger.

(2) Remove the detonator from the mine.

9-34. Fuze, Pressure/Pressure Release, Model 1952 (France)

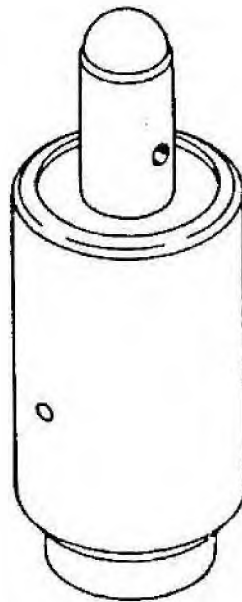


Figure 9-55. Fuze, Pressure/Pressure Release, Model 1952.

Dimensions	Case	Internal action	Operating force
Diameter: 0.9" Length: 2.2'	Steel	Pressure mechanical or pressure release with shear pin and ball release.	Pressure: 330 lbs approx.

a. General. This is a copy of the World War II German T.M.Z. 43 fuze. It is the instantaneous mechanical type actuated either by pressure or pressure-release. The plunger is fitted with a shear pin and retaining balls.

b. Use. This fuze is used with the Model 1948 antitank mine or with the offset fuzing device that actuates the plate-charge and shaped-charge mines.

c. Functioning. When the pressure plate of the mine (or the cover of the offset fuzing device) is screwed down it breaks the arming pin. Further pressure breaks the shear pin and the plunger depresses allowing the striker retaining balls to escape into the upper recess. Release of pressure allows the plunger to raise and the striker retaining balls to escape into the lower recess. The release of the spring loaded striker fires the percussion cap and detonator.

d. Installing and Arming. Attach the detonator (AP-38 short) to the fuze by means of the detonator retaining collar. The fuze is armed when the cover of the mine is screwed down and the fuze arming pin is sheared, which produces a distinct click.

e. Disarming. This fuze cannot be disarmed. Destroy the mine so fitted in place.

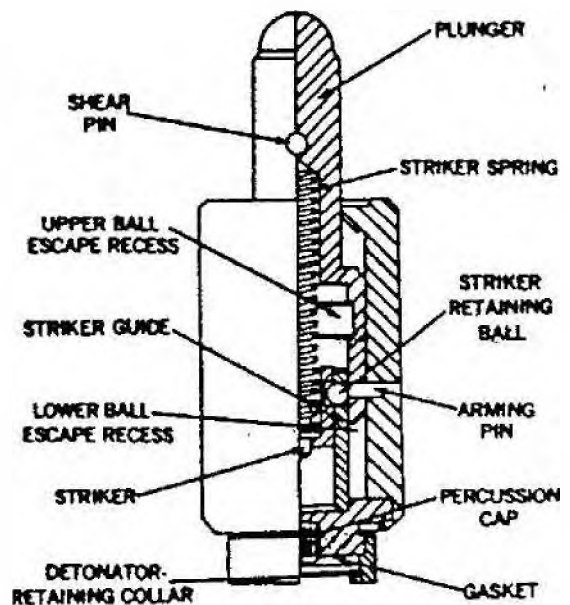


Figure 9-56. Fuze, Pressure/Pressure Release, Model 1952.

9-35. Fuze, Pressure, Model 1948 (France)

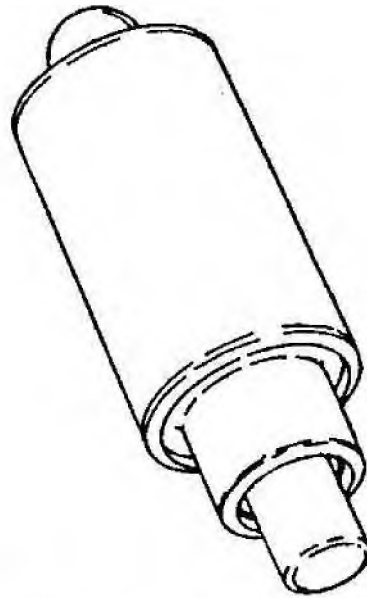


Figure 9-57. Fuze, Pressure, Model 1948.

Dimensions	Case	Internal action	Operating force
Diameter: 0.9" Length: 2.1"	Steel	Pressure mechanical, with shear pin release.	330 lb approx.

a. *General.* The Model 1948 pressure fuze is housed in a steel case. It has a spring-driven striker retained by a shear pin. The lower end of the case, which is smaller in diameter than the main part, is threaded and fitted with a detonator retaining-collar.

b. *Use.* This fuze is designed for use in the Model 1948 antitank mine and in the metallic offset fuze device for plate-charge and shaped-charge mines.

c. *Functioning.* The application of pressure to the striker head shears the shear pin, which releases the striker, driven by its spring, to fire the percussion cap and then the detonator.

d. *Installing and Arming.*

(1) Unscrew the collar from the lower end of the fuze.

(2) Insert a detonator (short AP-38) into the collar.

(3) Screw the collar back on the base of the fuze.

e. *Disarming.*

(1) Unscrew the collar from the base of the fuze.

(2) Separate the detonator from the collar.

f. *Precautions.* This fuze closely resembles the Model 1952 pressure/pressure release fuze which *cannot be disarmed*. Unless positive identification of this fuze can be made without removing pressure from the fuze, all devices using this fuze must be destroyed in place.

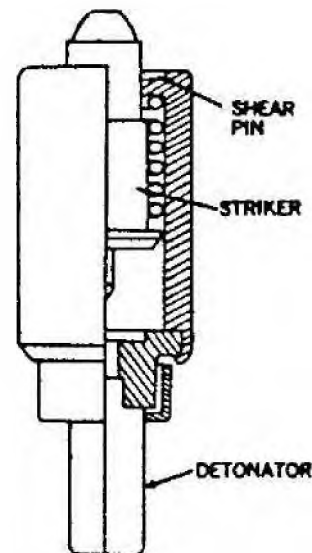


Figure 9-58. Fuze, Pressure, Model 1948.

9-36. Fuze, Pressure, Chemical, Plastic, Model 1951 (France)

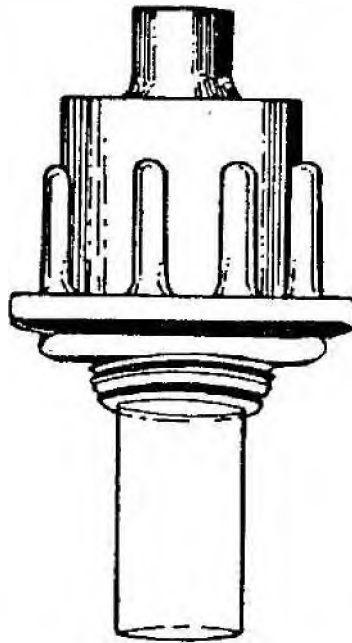


Figure 9-59. Fuze, Pressure, Chemical, Plastic, Model 1951.

Dimensions	Case	Internal action	Operating force
Diameter: 1.15" Length: 1.34" w/o cap	Plastic	Pressure-chemical	No data

a. *General.* Fuze consists of a plastic case, a plunger, a detonator-retaining ring, a vial of acid, and a chemical pellet. The vial of acid and the chemical pellet are contained in the case with the plunger positioned over them. The plunger is held by a shear collar rather than by a shear pin, as in the pressure chemical fuzes, Models 1949 and 1950.

b. *Use.* The fuze is used with the following mines:

Undetectable AT Mine 1947
Undetectable AT Mine 1951
Probe-proof AT Mine 1954

c. *Functioning.* Pressure on the plunger causes the shear collar to rupture. The plunger moves downward breaking the vial of acid. The acid, mixing with the chemical pellet, produces a flash that initiates the detonator.

d. *Installing and Arming.*

- (1) Unscrew the detonator retaining ring.
- (2) Place an undetectable detonator (Model 50) in the ring.
- (3) Screw the ring onto the base of the fuze.
- (4) Place the fuze in the mine.

e. *Disarming.* Follow the arming procedure in reverse order.

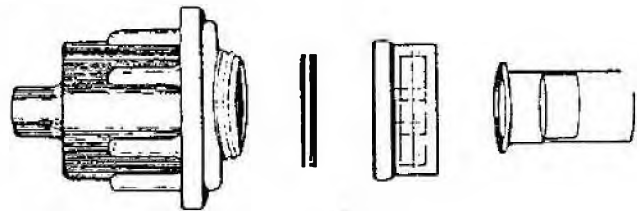


Figure 9-60. Fuze, Pressure, Chemical, Plastic, Model 1951.

9-37. Fuze, Antidisturbance, Model 1952 (France)

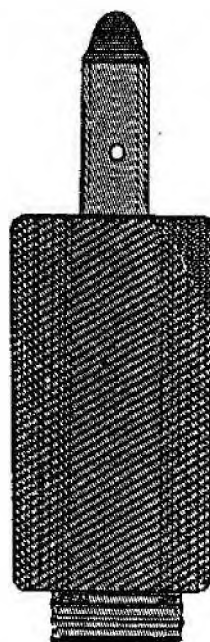


Figure 9-51. Fuze, Antidisturbance, Model 1952.

Dimensions	Case	Internal action	Operating force
Diameter: 0.9" Height: 2.3"	Steel	Mechanical	330 lb approx.

a. *General.* The fuze is of the pressure or pressure release type. The striker is made of metal.

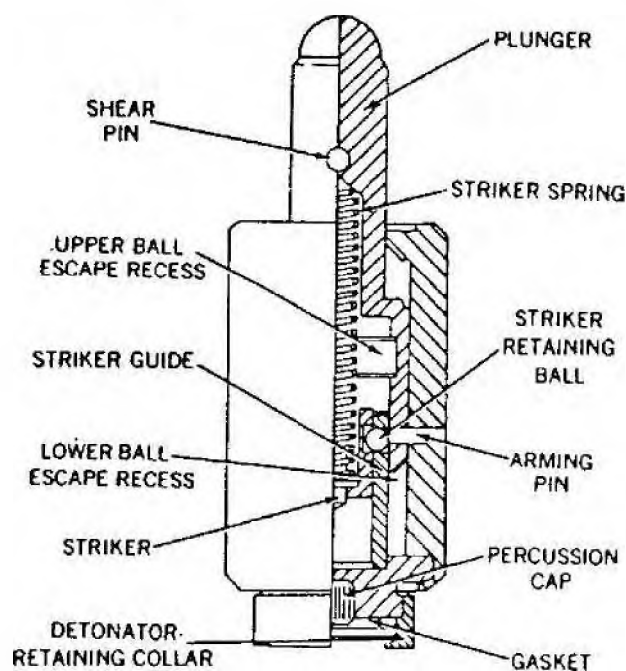


Figure 9-52. Fuze, Antidisturbance, Model 1952.

b. Use. The fuze is used with antitank mine, Model 1948 or with the offset fuzing device (which is used with the plate-charge and shaped charge mines).

c. Functioning. Pressure applied to the plunger when the fuze is installed in the mine shears the two arming pins. After the fuze is thus armed, further pressure (breaking the shear pin) or the release of pressure allows the striker retaining balls to escape and free the spring-actuated striker, which fires the percussion cap that sets off the detonator.

d. Installing and Arming.

(1) Attach the detonator (AP-38 short) to the fuze by means of the detonator-retaining collar.

(2) The fuze is automatically armed when the cover of the antitank mine, Model 1948 (or the cover of the offset fuzing device) is screwed down and the fuze arming pins are sheared. There is a distinct click when these arming pins break.

e. Disarming. This fuze cannot be disarmed; mines using it should be destroyed in place.

9-38. Fuze, Tilt Rod, Electromagnetic, M1957 (France)

Dimensions	Case	Internal action	Operating force
Diameter: 1.2" w/rod w/rod 18.6" w/2 rods 32.5"	Metallic	Mechanical-electro-magnetic	5.8"—66 lb

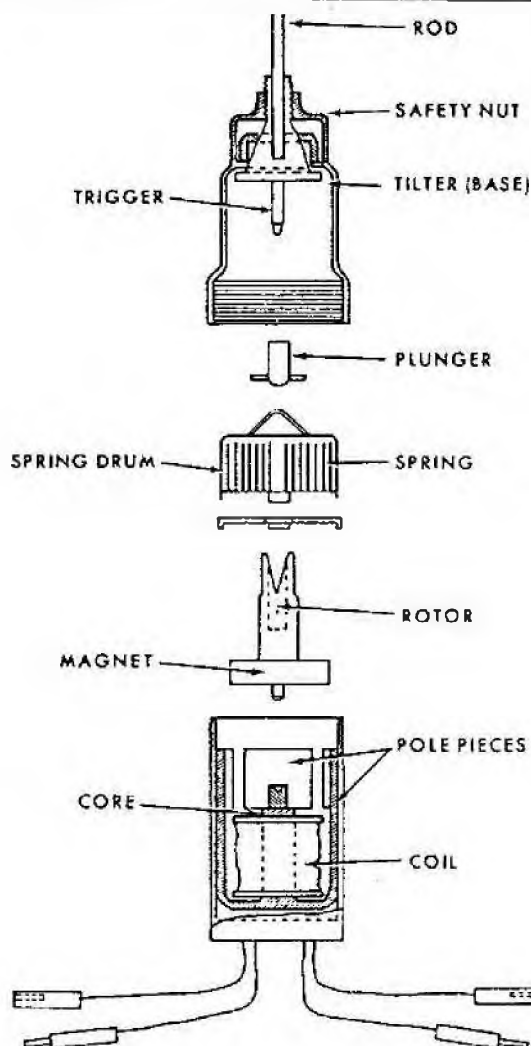


Figure 9-65. Fuze, Tilt Rod, Electromagnetic, M1957.

a. General. The fuze operates on the same principle as the Metallic Electromagnetic Fuze 1954(1) except that it has only one electric circuit instead of two. The fuze body consists of 2 pieces which, when screwed together, house the current generator assembly.

b. Use. The fuze is used with the metallic AT shaped charge mine, Model 56 (Mi AC M OC 56). The fuze may also be used to initiate the electrical detonator of any electrical igniting mechanism (provided the electrical resistance of the wire used is not too high). Tripwire attached to end of tilt wire may also be used for boobytrapping.

c. Functioning. When the tiltrod tilts, it also tilts the tilter base and consequently also the trigger located at the bottom of the latter. At a tilt angle of approximately 15°, this trigger releases the plunger upward. The escape of the plunger, in turn, releases the main spring and the rotor and the 4-pole magnet. The rotation of the magnet creates an alternating magnetic field, generating alternating current in the coil and exit circuit. The current lasts from 0.2 to 0.4 seconds.

d. Installing and Arming.

(1) Mount fuze on mine, stake etc.

(2) Mount the release rod on the fuze after unlocking the safety unit.

(3) Connect the lead wires of a detonator or electrical ignition device to the contact plugs of the fuze.

(4) Unscrew and remove the fuze's safety nut. Save the safety nut for possible future neutralization of the fuze.

e. *Disarming.* Reverse the installing and arming procedures.

9-39. Fuze, Pressure/Pull, M54/58 (France)

Illustration furnished for identification.

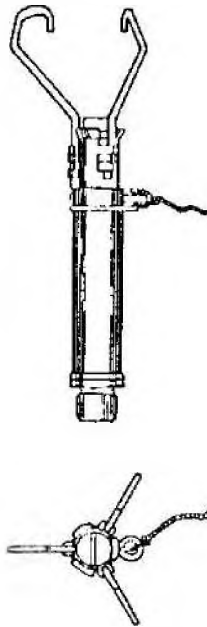


Figure 9-64. Fuze, Pressure/pull, M54/58.

9-40. Fuze, Pull-Friction Model 1951 (France)

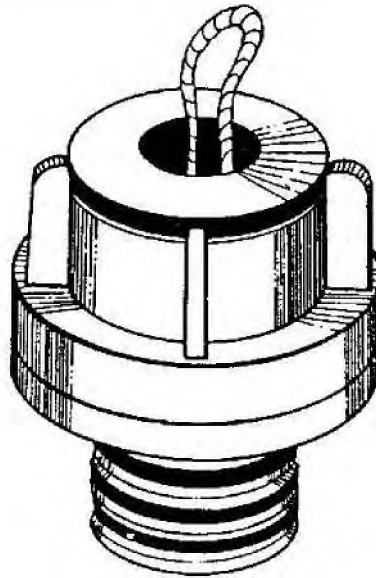


Figure 9-65. Fuze, Pull-friction Model 1951.

Dimensions	Case	Internal action	Operating force
Diameter: 0.8" approx. Height: 0.8" approx.	Plastic	Friction	2.2 to 7.7 lb

a. *General.* The lower end of the fuze is threaded and the upper portion, larger in diameter than the threaded portion, is strengthened by 4 external vertical ribs. The filling of the fuze is a match head compound in which is embedded a pull cord, the loop of which extends above the fuze case for attaching a pull wire.

b. *Use.* Fuze is used in improvised mines and boobytraps. Since it does not have a safety, great care must be taken when using this fuze.

c. *Functioning.* A pull on the cord draws it through the friction compound, producing sufficient heat to ignite the compound.

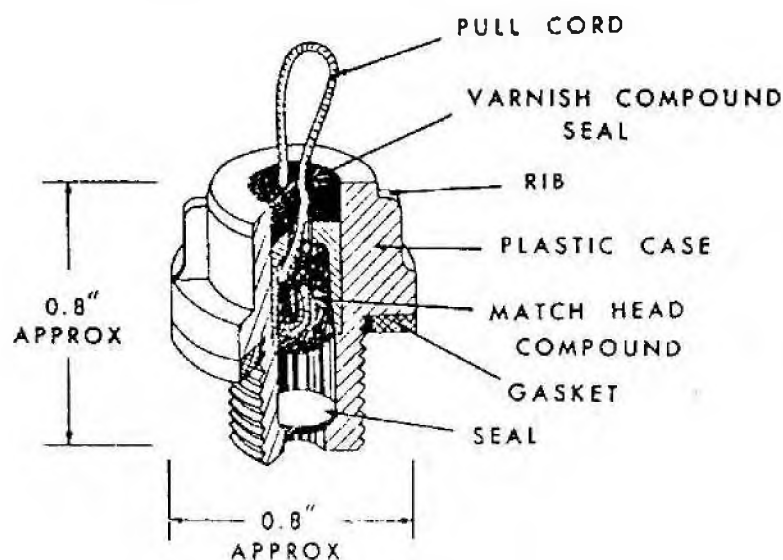


Figure 9-66. Fuze, Pull-friction Model 1951.

d. Installing and Arming.

- (1) Place the appropriate detonator in the boobytrapping well(s) of the mine.
- (2) Screw the fuze into the boobytrapping well.

(3) Attach an anchored trip cord to the pull loop of the fuze.

e. Disarming.

- (1) Cut the trip cord.
- (2) Remove the fuze and detonator from the mine.

9-41. Fuze, Pressure/Pull M54 (France)

Dimensions	Case	Internal action	Operating force
Diameter: 0.6" Height: 4.4"	Steel	No data	No data

a. General. Fuze can be submerged under 50cm of water for 15 days without damage.

b. Use. Fuze is used with bounding mines M51 and M51/55.

9-42. Mine, Antitank, No. 25 (Israel)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	16 lb	Friction	88 to 86 lb	Cast TNT 15.4 lb.	No data

9-43. Mine, Antitank, No. 26 (Nonmetallic) (Israel)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	19.8 lb	Pressure	175 to 265 lb	TNT 15.5 lb	No data

General. Model No. 4 split-pin pressure fuze is used with this mine.

9-44. Fuze, Pressure, No. 4 (Israel)

Illustration furnished for identification.

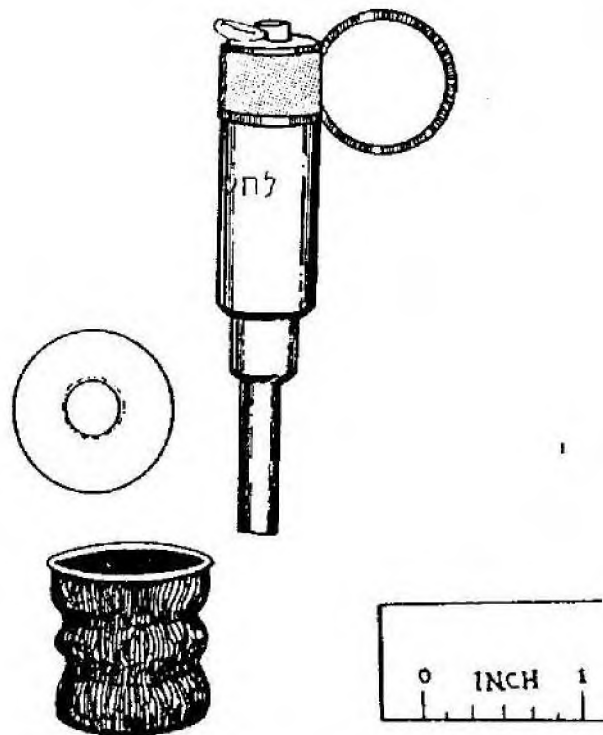


Figure 9-87. Fuze, Pressure, No. 4.

9-45. Mine, Antitank, Nonmetallic, Model SH-55 (Italy)

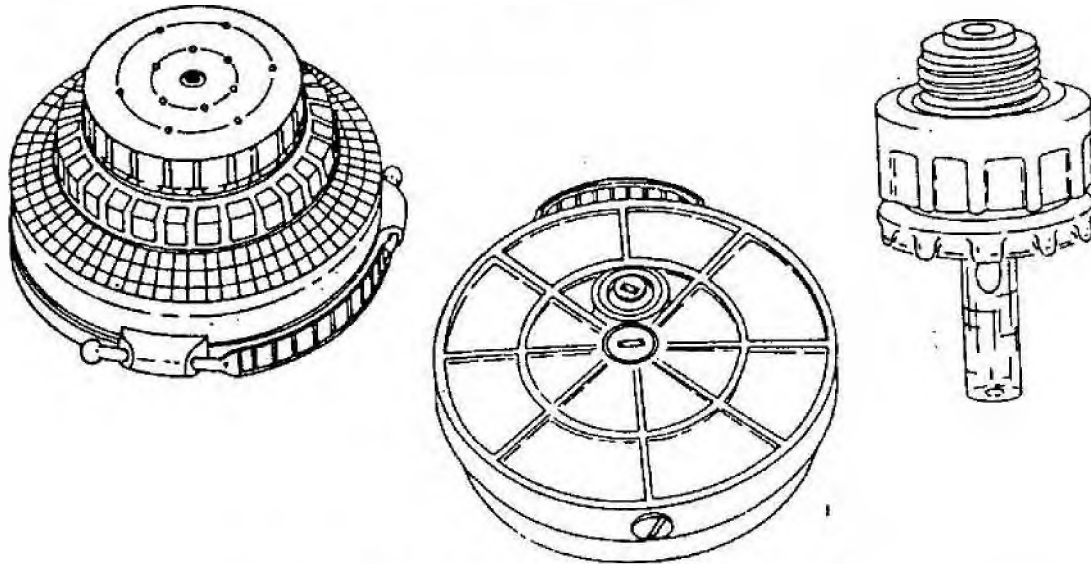


Figure 9-68. Mine, Antitank, Nonmetallic, Model SH-55.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 10.49" Height: 4.03"	16.1 lb	Integral pneumatic	440 lb.	12.1 lb composition B (sometimes TNT)	No data

a. *General.* This is a small nondetectable plastic mine that has only two metallic components—the striker point and the detonator case. Its pneumatic fuze resists shock and malfunction from mechanical failure. This mine has two secondary fuze wells.

b. *Use.* This mine is used against tanks and other vehicles.

c. *Functioning.* A constant pressure on the top forces down the pressure plate, compressing the air chamber. The air, exhausted downward through a small aperture, depresses a plastic dia-

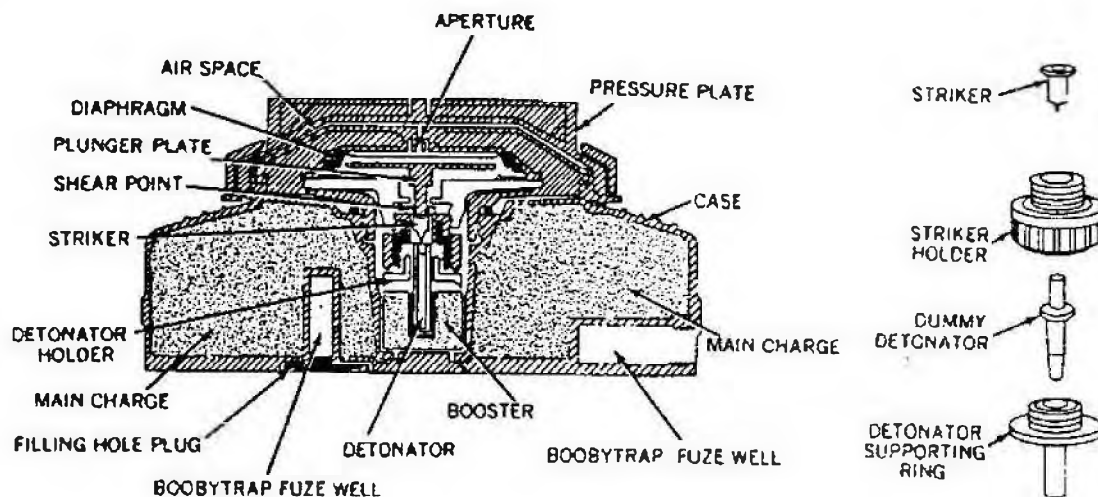


Figure 9-69. Mine, Antitank, Nonmetallic, Model SH-55.

phragm, which pushes down the plunger plate and puts pressure on the striker. The striker retaining-collar fails, which then permits the striker to be forced onto the detonator and initiate the firing chain.

d. Installing and Arming.

(1) Unscrew and remove the pressure plate and its attached detonator retaining-collar.

(2) Remove the detonator retaining-collar and replace the dummy detonator with a live detonator.

(3) Replace the detonator retaining-collar.

(4) Replace the pressure plate.

e. Disarming.

(1) Check for and remove any antilift devices.

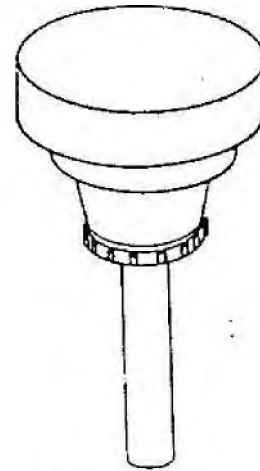
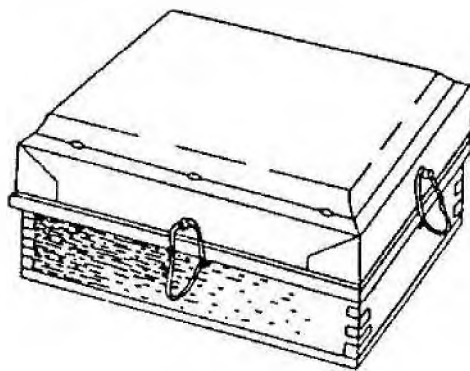
(2) Unscrew and remove the pressure plate.

(3) Unscrew the detonator retaining-collar.

(4) Remove the detonator.

(5) Take the mine to a safe storage or disposal area.

9-46. Mine, Antitank, Wooden, Model CS 42/2 (Italy)



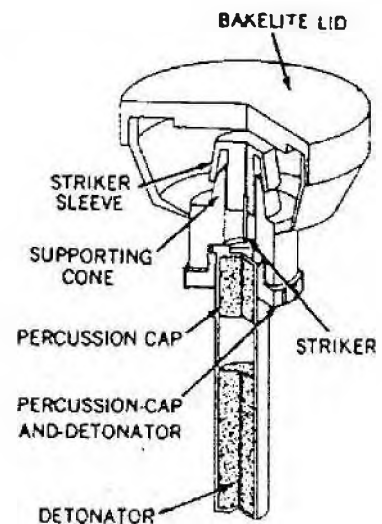
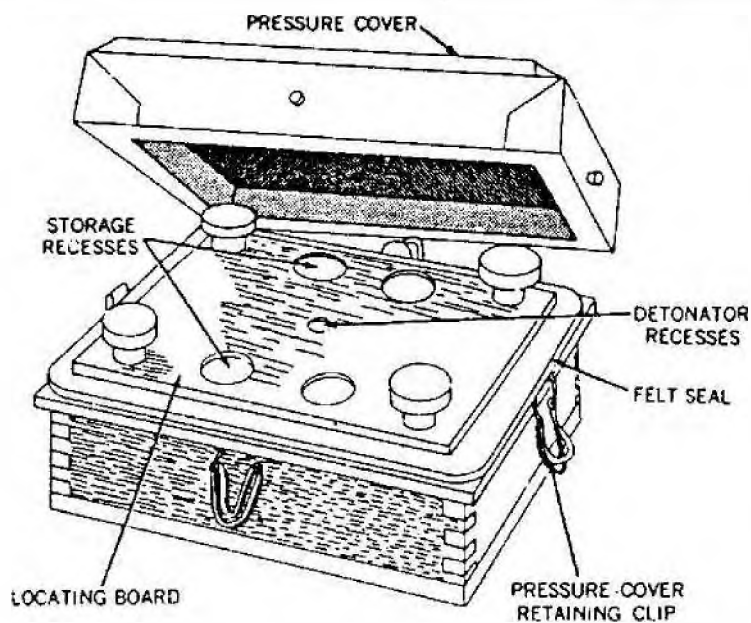
PRESSURE FUZE

Figure 9-70. Mine, Antitank, Wooden, Model CS 42/2.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: Length: 13.26" Height: 6.24" Width: 11.29"	17.6 lb	Model 42/2 pressure or Model PMC- 43 pressure.	220 lb approx.	11 lb. TNT in cartridge form —25.7 oz cartridges.	No data

a. *General.* This is a wooden box-type unit with four plastic fuzes, but with enough metal to make it detectable. It has three parts—a box for the explosive, a frame to support the pressure board,

and the pressure board. The top is covered with cloth painted or dyed in a camouflage pattern. This mine is no longer produced, but will remain in service until present stocks are exhausted.



PRESSURE FUZE

Figure 9-71. Mine, Antitank, Wooden, Model CS 42/2.

b. Use. It is laid in pattern in minefields to damage tracks of armored vehicles by concussion. By the substitution of the Model PMC 43 button type fuze for the Model 42/2 pressure fuze and by weakening the pressure board supports so that they fail under a man's weight it may be converted to an antipersonnel mine.

c. Functioning. Pressure on the top breaks the fragile supports of the pressure board and forces it down on the fuzes, actuating them and detonating the mine.

d. Installing and Arming.

(1) Remove the lid.

(2) Remove the four wooden cylinders (false fuzes) from the fuze wells.

(3) Remove the fuzes from their transport recesses.

(4) Attach OTO detonators to the fuzes (42/2) and place the fuzes in the wells.

(5) Replace and lock the lid on all four sides.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Remove the lid and the fuzes from the fuze wells.

(3) Separate the detonators from the fuzes.

(4) Remove the mine and fuzes to a safe storage or disposal area.

9-47. Mine, Antitank, Wooden, Model CS 42/3 (Italy)

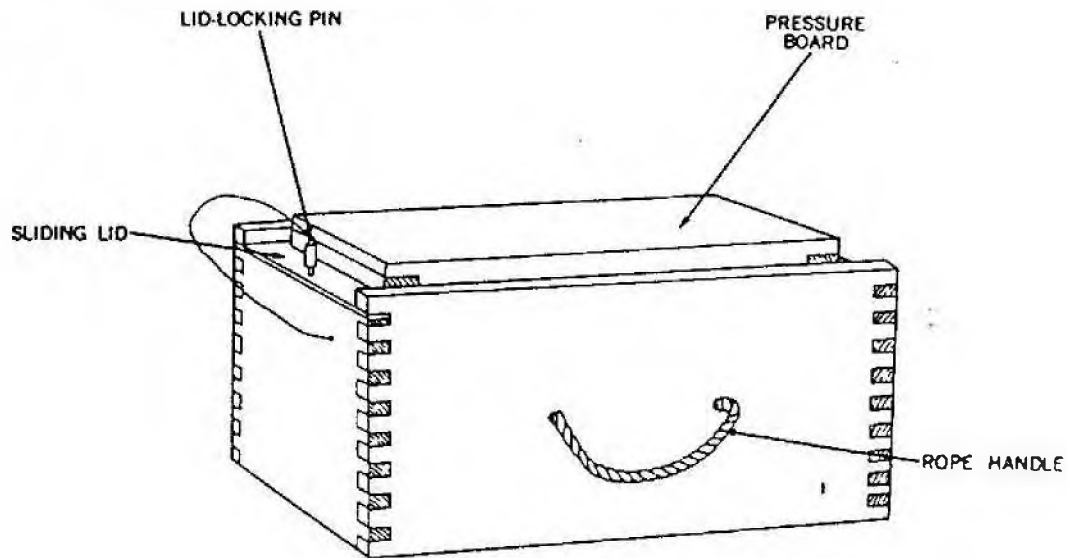


Figure 9-72. Mine, Antitank, Wooden, Model CS 42/3.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: Length: 11.07" Height: 5.65" Width: 9.2"	15.4 lb	Pressure Model 42/2	220 lb. (approx)	11.0 lb. TNT or similar explosive.	No data

a. *General.* This is essentially a modified wooden CS 42/2 antitank mine with four pressure fuzes. It has no metallic parts and is thus nonde-

tectable by electronic detectors. The lid is held in place by thin tongues sliding in grooves in the wooden case.

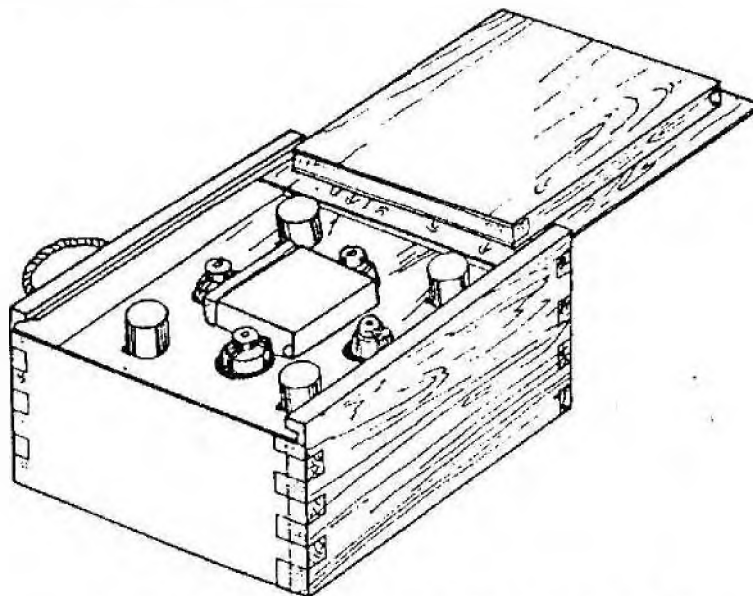


Figure 9-73. Mine, Antitank, Wooden, Model CS 42/3.

b. Use. This blast mine is used to damage tank tracks.

c. Functioning. The thin edges of the lid fall under pressure and force the pressure board onto the fuzes, which, thus actuated, detonate the mine.

d. Installing and Arming.

(1) Remove the lid locking-pin and slide the lid back.

(2) Remove the four wooden cylinders (false fuzes) from the fuze wells.

(3) Attach OTO detonators to the fuzes and place them in the fuze wells.

(4) Replace the lid, being careful not to place any pressure on the pressure-board.

(5) Replace the lid locking-pin.

e. Disarming.

(1) Inspect for and remove any antilift devices.

(2) Remove the lid locking-pin and slide the lid back.

(3) Remove the fuzes from the mine and separate them from the detonators.

(4) Take the mine and fuzes to a safe storage or disposal area.

9-48. Mine, Antitank, Model "Saci" 54/7 (Italy)

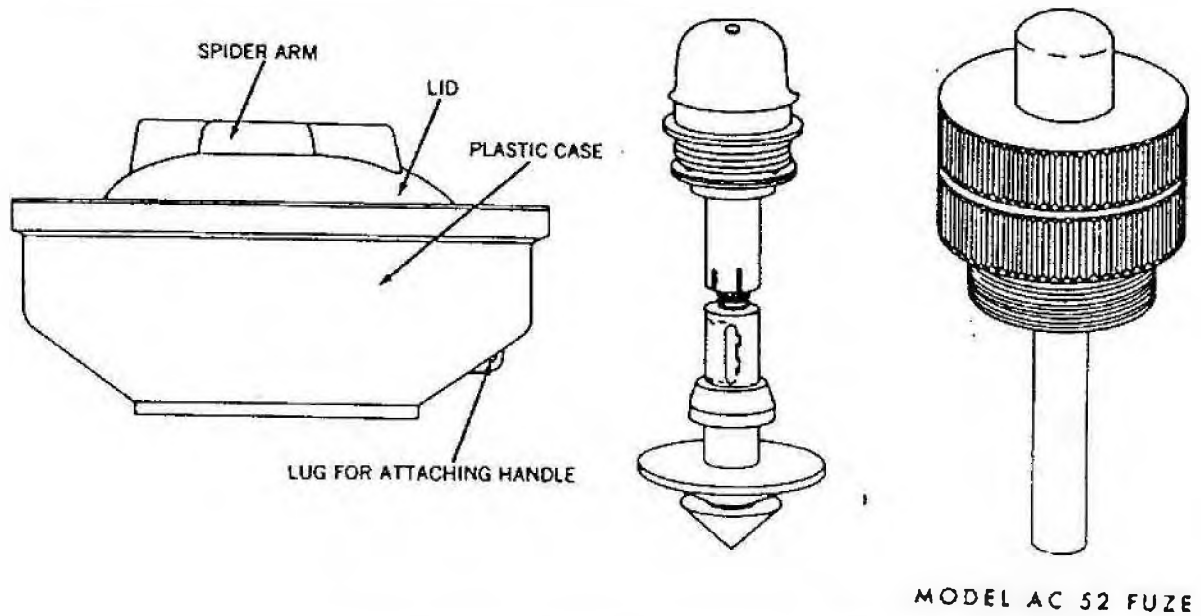


Figure 9-74. Mine, Antitank, Model "Saci" 54/7.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Light Diameter: 10.88" Height: 6.04"	13.7 lb	3 each AC52 pressure-mechanical, with shear plate release.	264 to 418 lb.	11.0 lb TNT	No data
Heavy Height: 7.41" Diameter: 10.88"	22.5 lb			19.8 lb TNT	

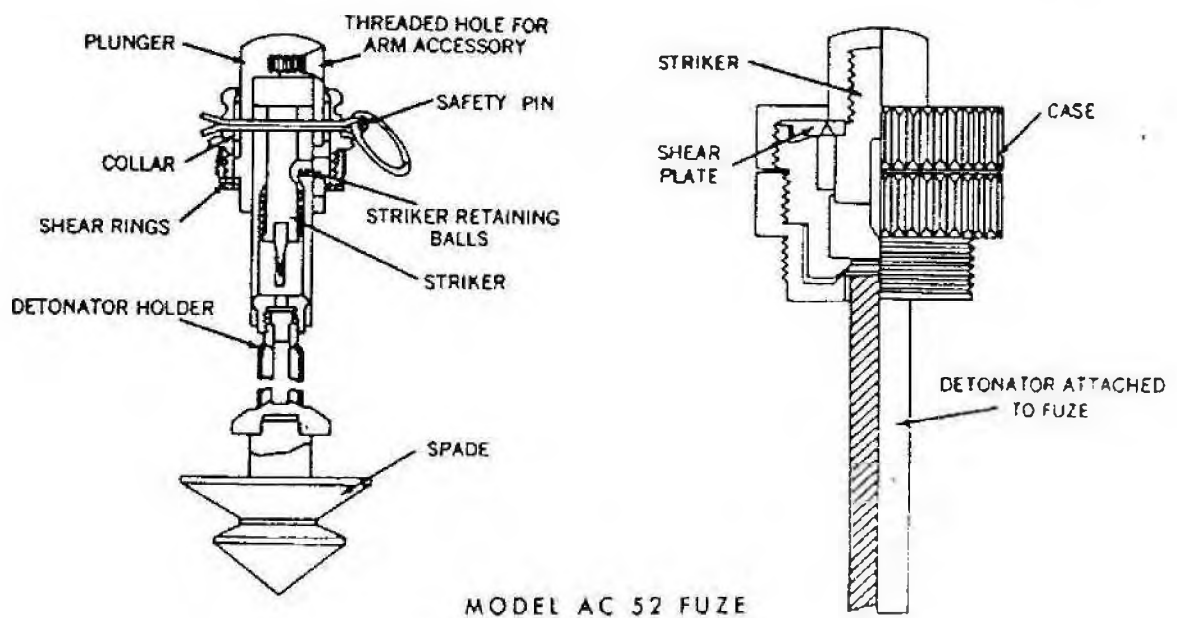


Figure 9-75. Mine, Antitank, Model "Saci" 54/7.

a. General. This mine is made in two sizes. This plastic model, because of the small amount of metal in the striker, is locatable by small metals electronic detectors. It has three standard fuze wells and two for boobytrapping devices: one in the bottom for an antisturbance fuze and one in the side of the mine. It is said that the mine functions at temperatures ranging from -5° to $+140^{\circ}$ F. Its small pressure surface makes it resistant to detonation by antimine devices, such as explosive charges and flails.

b. Use. The SACI mine is used to damage tank tracks and suspension systems.

c. Functioning. Pressure on the top of the mine is transmitted by the crushing of the lid to the

spider arms, from which it is transferred to the fuzes, actuating the firing chain.

d. Installing and Arming.

- (1) Remove the lid.
- (2) Remove the false fuzes from the wells.
- (3) Place the mine in the ground.
- (4) Attach the detonators to the AC 52 fuzes and screw the assemblies into the wells.
- (5) Replace the lid.

e. Disarming. This mine should be blown in place, as it may be fitted with an ACS 52 antisturbance fuze.

9-49. Mine, Antitank, FD Nonmetallic, Air Droppable (Italy)

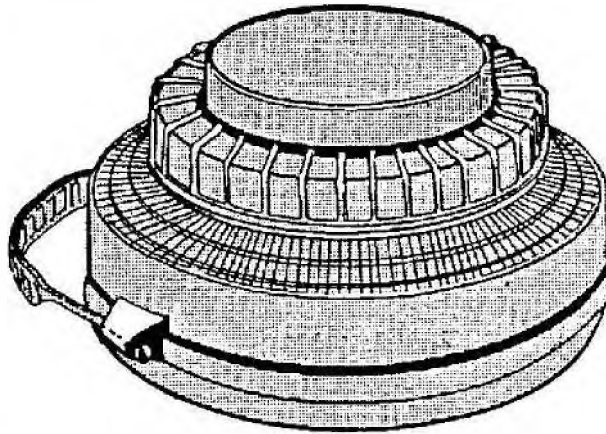


Figure 9-76. Mine, Antitank, FD Nonmetallic, Air droppable.

Dimensions	Wt	Fuse	Operating force	Explosive	
				Main charge	Booster
Diameter: 11" Height: 5.6"	16.5 lb	No data	375-463 lb	No data	No data

a. *General.* This mine is made of plastic and is waterproof.

b. *Use.* Mine can be dropped from airplane or helicopter.

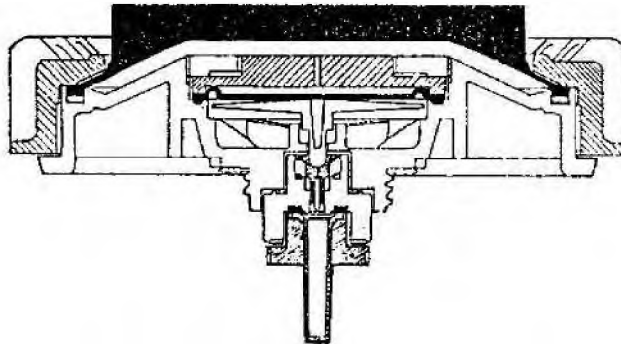


Figure 9-77. Mine, Antitank, FD Nonmetallic, Air droppable.

c. *Functioning.* Pressure on the pressure plate activates the mine.

9-50. Mine, Antipersonnel, Minelba, Type A (Italy)

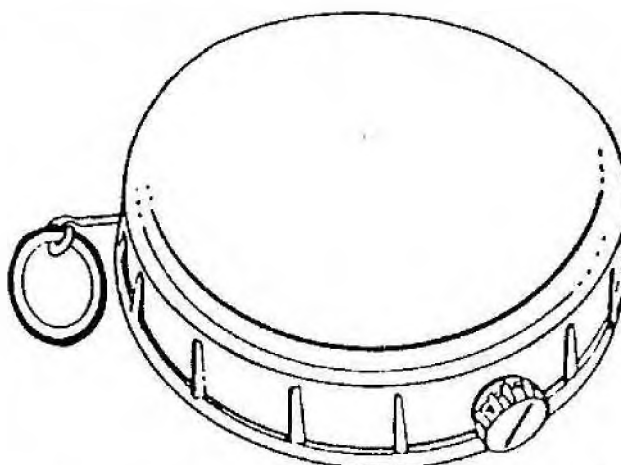


Figure 9-78. Mine, Antipersonnel, Minelba, Type A.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.2" Height: 1.2"	6 oz. (approx)	Integral, pneumatic, with safety pin.	Weight of man's foot	Unknown	

a. General. This mine consists of a marbled plastic case, a black rubber-covered aluminum pressure plate, a main charge, a detonator, and a pneumatic fuze. The fuze has an air-compression

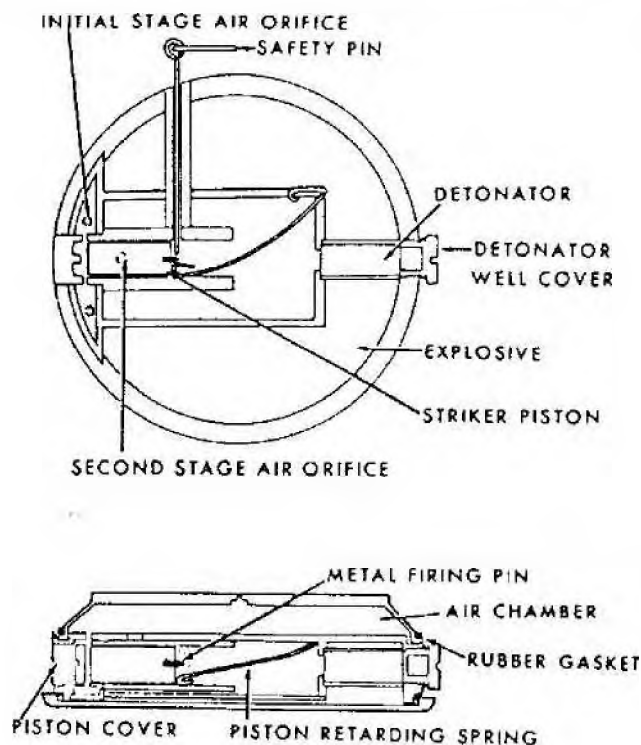


Figure 9-79. Mine, Antipersonnel, Minelba, Type A.

chamber, a piston block, a piston, a piston retarding-spring, and a firing pin. This fuze prevents actuation by explosive forces of short duration.

b. Use. This mine may be laid in antipersonnel minefields and in antitank minefields to hinder clearing operations.

c. Functioning. Force applied on the pressure plate compresses the air in the compression chamber. Air is forced through the initial stage air orifice, forcing the striker piston forward. When the piston passes the second stage orifice it is accelerated and drives the firing pin into the detonator.

d. Installing and Arming.

(1) Remove the detonator well cover.

(2) Insert the detonator, if the firing pin is not visible within the detonator well. If visible, destroy the mine.

(3) Replace the detonator well cover.

(4) Remove the safety pin.

NOTE

Do not squeeze the mine or handle it roughly after the safety pin is removed.

e. Disarming.

(1) Search for and remove any antilift devices.

(2) Insert safety pin in safety pin hole.

(3) Remove the detonator well cover and take out the detonator.

(4) Replace the detonator well cover.

(5) Take mine and detonator to a safe storage or disposal area.

9-51. Mine, Antipersonnel, Minelba, Type B (Italy)

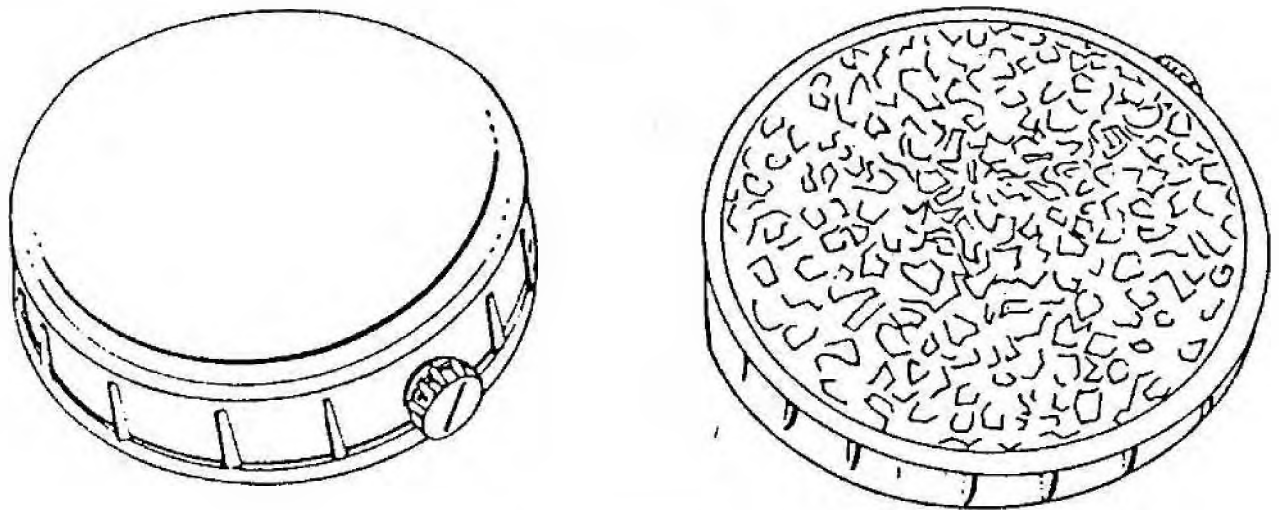


Figure 9-80. Mine, Antipersonnel, Minelba, Type B.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.25" Height: 1.28"	7 oz. (approx)	Integral, pneumatic, with ball release.	Weight of man's foot.	Unknown	No data

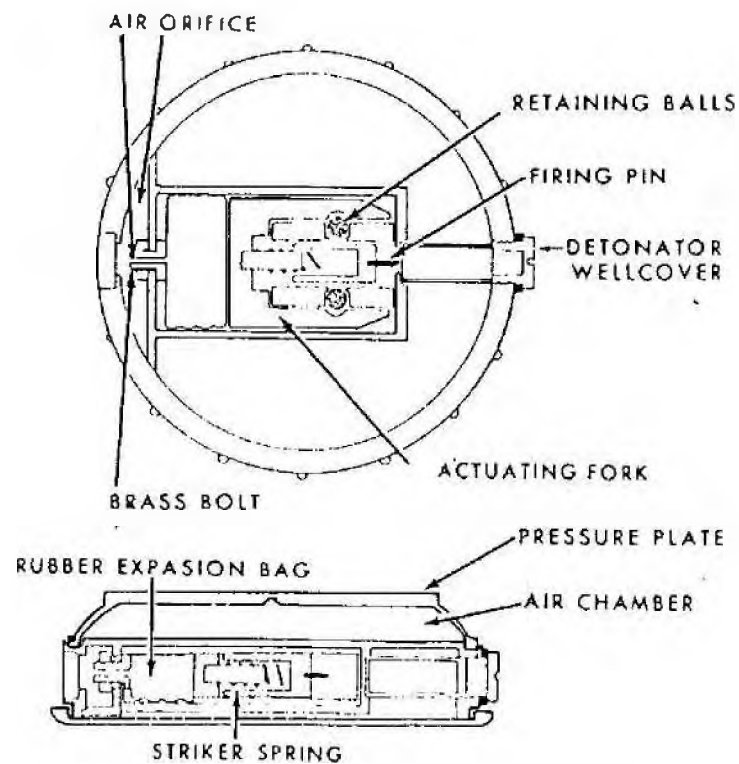


Figure 9-81. Mine, Antipersonnel, Minelba, Type B.

a. General. The Minelba type B mine consists of a marbled pink plastic case, black rubber-covered aluminum pressure plate, main charge, detonator, and pneumatic fuze. It differs from the type A mine in outer appearance only by the absence of a safety pin and ring. The pneumatic fuze has a rubber expansion bag, actuating fork, striker retaining balls, spring-driven striker, and firing pin. This fuze prevents actuation by explosive forces of short duration.

b. Use. This mine is laid in antipersonnel minefields and in antitank minefields to hinder clearing operations.

c. Functioning. Force applied on the pressure plate moves air into the compression chamber and then into the rubber expansion bag, which moves the actuating fork forward, releases the retaining balls, and frees the striker to fire the detonator.

d. Installing and Arming.

- (1) Remove the detonator well cover.
- (2) Insert the detonator, if the firing pin is

not visible within the detonator well. If visible, destroy the mine.

- (3) Replace the detonator well covers.

NOTE

This mine has no safety device. It is armed when the detonator is inserted.

e. Disarming. As this mine has no safety it *should be destroyed in place*. If the tactical situation demands removal, however—

- (1) Check for and remove any antilift devices.
- (2) Lift the mine without squeezing. Place it bottom-down in the palm of the hand.
- (3) Grasp the outer edge of the mine body and unscrew the detonator well cover.
- (4) Remove the detonator and replace the detonator well cover.
- (5) Take the mine and detonator to a safe storage or disposal area.

9-52. Mine, Antipersonnel, Model AUS 50/5 (Italy)

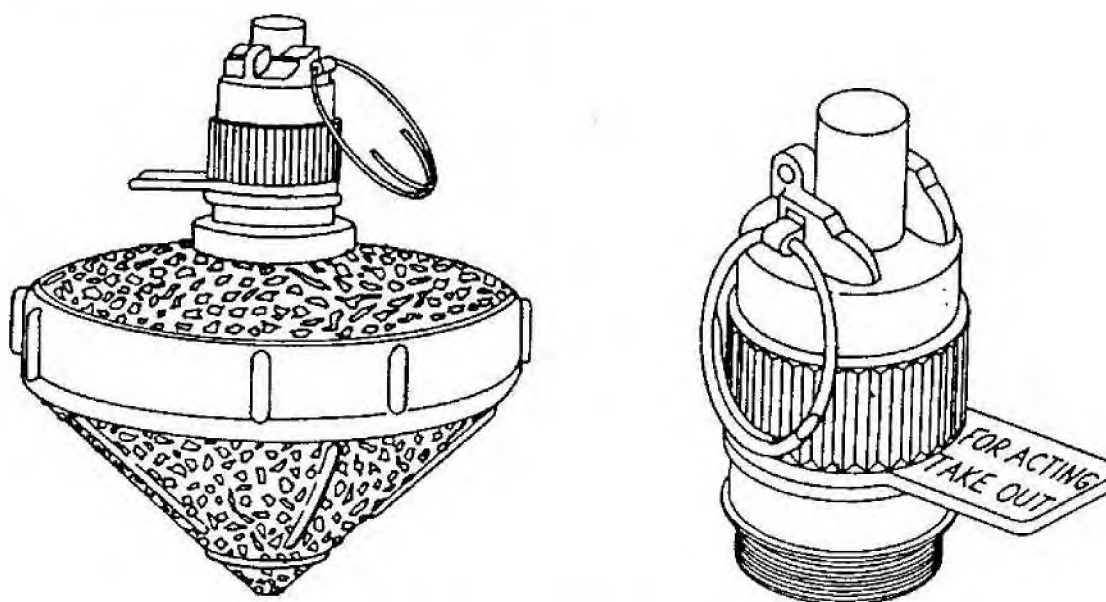


Figure 9-52. Mine, Antipersonnel, Model AUS 50/5.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.95" Height: 3.85"	3.1 lb.	PS-51 pressure pull	30 to 50 lb pressure or 1.16 lb pull.	5.2 oz. TNT or compound B.	18.5 gr. black powder.

a. General. Because of its topline shape this mine is particularly adaptable to easy and quick

installation and is unlikely to sink in soft ground or snow. The plastic case, contains the spool-

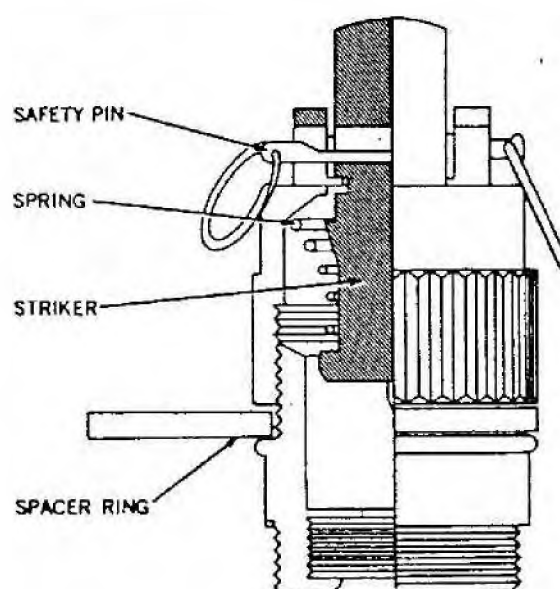
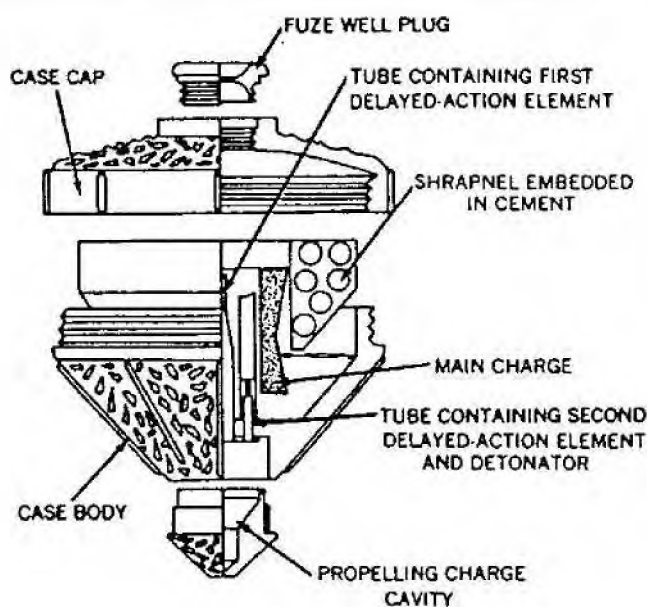


Figure 9-53. Mine, Antipersonnel, Model AUS 50/5.

shaped main charge, shrapnel, and propellant. The mine has no outer casing; the surrounding earth acts as a mortar.

b. *Use.* This mine used in pattern or nuisance mining against personnel.

c. *Functioning.* Pressure or pull shears or removes the safety pin; the striker then hits and detonates the percussion cap, initiating the two delay trains. The first delay, upon burning through, fires the black powder charge, hurling the mine into the air. When it reaches a height of about 50.8 centimeters, the second delay, having burnt through, fires the main charge. The shrapnel projected therefrom has a 1.8-meter vertical spread in 13.7 meters of horizontal travel. The effective fragmentation radius is 15 meters.

d. *Installing and Arming.*

(1) Remove the plug from the fuze well.

(2) Insert a blasting cap in the fuze well, open end down, so that it fits over the tube of the second delayed-action element.

(3) Prepare the fuze (PS-51) and screw it into the mine.

(4) Prepare a conical hole and emplace the mine so that the upper part is just above the surface.

(5) If pull action is desired, arrange and attach the tripwire.

(6) Remove the fuze safety.

e. *Disarming.*

(1) Carefully unscrew the fuze and remove the detonator. Do not attempt to insert the safety.

(2) Remove the mine, fuze, and detonator to a safe storage or disposal area.

9-53. Mine, Antipersonnel, Type R (Italy)

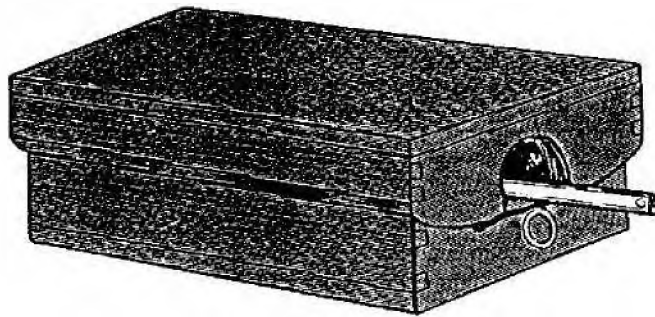


Figure 9-84. Mine, Antipersonnel, Type R.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 5.9" Height: 1.8" Width: 3.3"	1 lb	Pressure Pull	4.4—6.6 lb	TNT 0.33 oz	No data

a. General. The body of the mine is made of wood. The destructive action is fragmentation and concussion. The mine throws shrapnel 5–10 meters. Normal distance between mines is 5 paces.

b. Use. There is also a practice model of this mine used for troop training.

c. Functioning. Pressure on the cover forces the free end down pushing the “butterfly” striker-retaining pin from the fuze striker. The spring-loaded striker drives onto the percussion cap of

the OTO detonator. The firing chain is carried through the cap, detonator, and main charge of mine. The detonation of the main charge fractures the fragmentation plates and hurls the shrapnel.

d. Installing and Arming.

- (1) Emplace mine and raise lid.
- (2) Cock fuze, insert safety pin and butterfly pin.
- (3) Attach OTO detonator to the fuze.
- (4) Insert fuze in charge and place fuze and

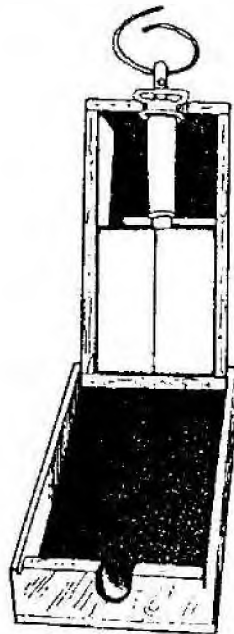


Figure 9-85. Mine, Antipersonnel, Type R.

charge in case with charge at hinge end. Fuze rests in saddle with collar inside of case and butterfly pin outside, close to case. Butterfly should be down and parallel to ground.

(5) Arrange shrapnel plates (1 in back and 1 each side of the charge).

(6) Gently lower the lid so it is in contact with wings of the butterfly pin.

(7) Remove the safety pin.

e. Disarming.

(1) Replace safety pin.

(2) Raise cover.

(3) Remove charge and fuze.

(4) Remove fuze from charge and detonator from fuze.

(5) Lift mine.

9-54. Mine, Antipersonnel, Valmara (Italy)



Figure 9-86. Mine, Antipersonnel, Valmara.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.13" Height: 4.63"	7.04 lb	Pressure Pull	Pressure 13.6 lb Pull 4.8 lb	Comp B 1.2 lb	No data

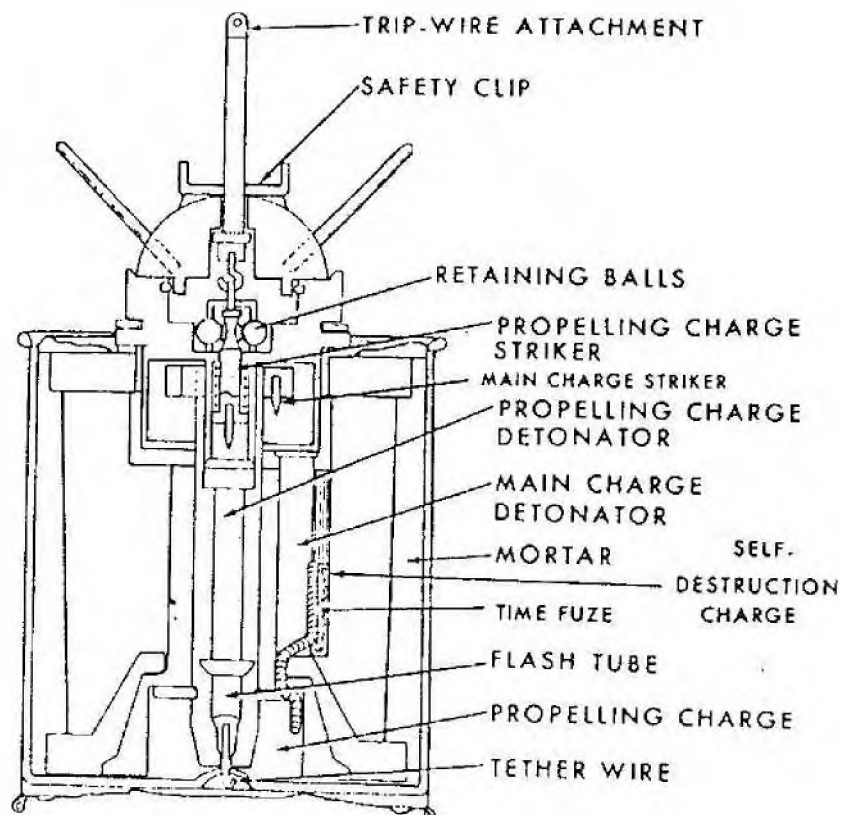


Figure 9-87. Mine, Antipersonnel, Valmara.

a. General. The mine body is metal. Mine has an effective radius of 10-15 meters and produces approximately 1200 fragments (5x5x5mm totaling 3.3 lb). Mine uses OTO detonator. The mine has a tether-wire activated burst.

b. Use. This mine is laid for security of foot troops and in mixed minefields to make removal difficult.

c. Functioning. Pressure or lateral pull on the fuze tilts the fuze dome, raising the ball retention cage, releasing the retention balls, and freeing the striker to ignite the propellant. This projects the fragmentation cannister into the air until the tether wire is taut, where it explodes spreading shrapnel in all directions.

d. Installing and Arming.

(1) Put the mine in a hole about 15 centimeters (6 inches) deep.

(2) Fill earth in the hole around the mine body.

(3) Remove the protective cap. Two detonators are required. One is inserted in the flash tube

to ignite the propelling charge. The second (main charge detonator) is inserted in a holder about 1 inch from the center.

(4) Screw on the fuze and attach the anchored trip wires.

(5) Remove the safety clip retaining-pin and then the safety clip.

(6) Cover the mine, leaving only the ends of the fuze prongs exposed.

e. Disarming. Be extremely careful. Do not apply pressure on the fuze prongs.

(1) Search for and remove any antilift devices. Trace trip wires from mine to anchor for small antipersonnel mines or antihandling devices.

(2) Replace the safety clip and the safety clip retaining-pin.

(3) Remove the fuze and detonators from the mine.

(4) Lift the mine from the hole.

(5) Take the mine and the fuze to a safe storage or disposal area.

9-55. Mine, Antipersonnel, Nonmetallic, AUPS-Brind (Italy)

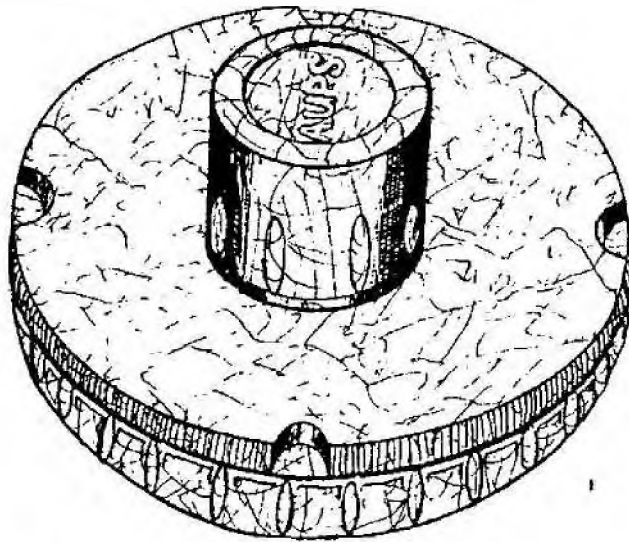


Figure 9-88. Mine, Antipersonnel, Nonmetallic, AUPS-Brind.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.8" Height: 1.4"	10.5 oz	Pressure Pull hydrostatic	22—24 25 lb	3.8 oz Tetryl, PGTN, or TNT.	3.2 oz Tetryl, PENT, or TNT.

a. General. This is a plastic mine, with 1 fuze well located on the top. It is a blast type mine and has an effective blast radius of 3 to 5 meters. The firing pin is the only metallic component.

b. Use. The mine is used for sabotage and destruction in water against divers and as a booby trap device. It may be emplaced by hand or dropped from aircraft.

c. Functioning. The mine has an interchangeable fuze system which allows the use of a pressure fuze, a pull fuze for booby traps, or a hydrostatic fuze. A serrated steel jacket is furnished as an accessory. When used, it converts the mine to a fragmentation type with a lethal radius of 10 meters.

9-56. Mine, Antipersonnel, MAUS, Nonmetallic, Air Droppable (Italy)

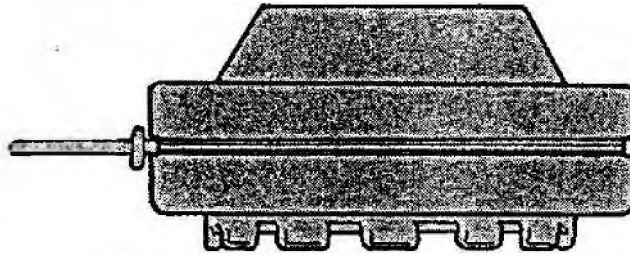


Figure 9-89. Mine, Antipersonnel, MAUS, Nonmetallic, Air droppable.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.5" Height: 1.9"	8.75 oz	Pneumatic	15.4—30.8 lb	Tetryl 0.7 oz.	

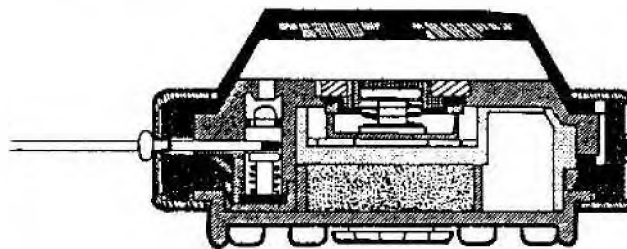


Figure 9-90. Mine, Antipersonnel, MAUS, Nonmetallic, Air droppable.

a. *General.* The mine is a flat cylinder of plastic.

b. *Use.* The mine is designed to be dropped by airplane or helicopter behind enemy lines or in areas of guerilla activity.

c. *Functioning.* When the mine is stepped on, a fuze under a rubber diaphragm is compressed and drives home the firing pin, setting off the mine. *Antishock Device.* To prevent the mine from exploding when it strikes the ground, a plastic fork prevents the firing pin from being activated (by a

blow or fall). When the pressure on the diaphragm lasts, however, air filters through an orifice expanding a thimble-like rubber membrane and opening the fork so that the firing pin can fall.

d. *Safety Device.* The mine is equipped with a safety pin. As long as this pin is in place, it keeps open a valve connecting the space under the rubber diaphragm to the outside. Air can enter and leave freely; thus compressing the diaphragm will not activate the mine.

9-57. Mine, Antipersonnel, "Lory", Nonmetallic, Air Draggable (Italy)

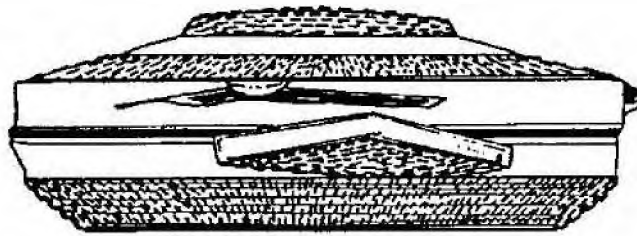


Figure 9-91. Mine, Antipersonnel, "Lory," Nonmetallic, Air droppable.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.7" Height: 1.6"	8.1 oz.	Pressure	22-33 lb	3.2 oz	NA

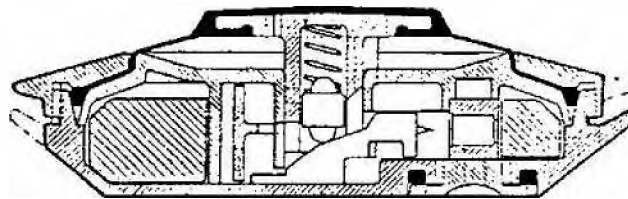


Figure 9-92. Mine, Antipersonnel, "Lory," Nonmetallic, Air droppable.

a. *General.* The mine resists shock and is water-proof.

b. *Use.* The mine can be laid from moving vehicles, helicopters, or low flying aircraft.

c. *Functioning.* Required pressure forces the

pressure plate down, causing the spring and piston to move downward also. Air pressure escapes from a bladder and allows the delay lever to rotate releasing the striker to hit the detonator and detonate the mine.

9-58. Fuze, Pull "R" (Italy)

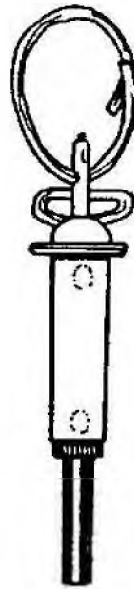


Figure 9-58. Fuze, Pull "R."

Dimensions	Case	Internal action	Operating force
Diameter: 0.6" Height: 2.6"	Metal	Mechanical	4.4—6.6 lb.

a. *General.* The fuze body is of metal and cylindrical in shape. A modified version "RM" has two collars around the body for positioning in the RM mine, with also a ring on the striker retaining pin for a trip wire.

b. *Use.* It is used in standard or improvised mines.

c. *Functioning.* Removal of striker retaining pin allows the spring-loaded striker to fall on the detonator.

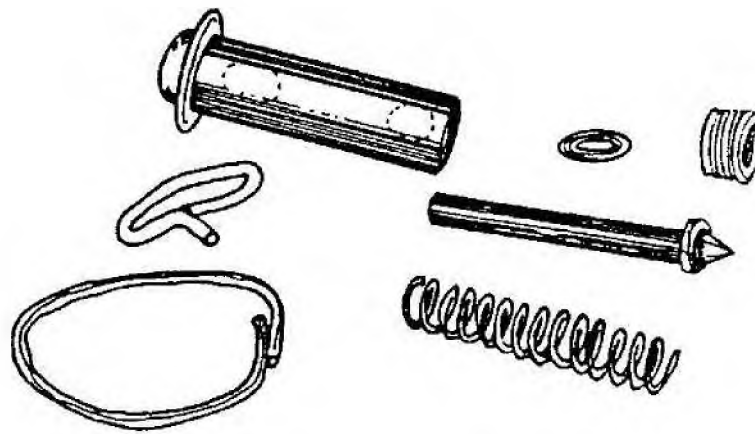


Figure 9-59. Fuze, Pull "R."

9-59. Fuze, Antidisturbance, Mine, ACS-52 (Italy)

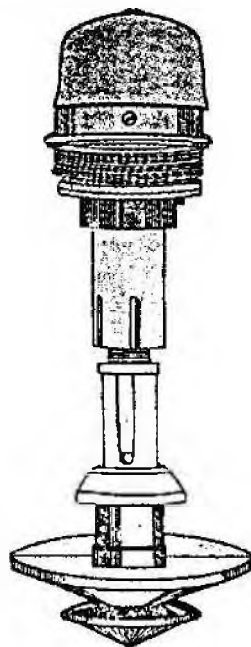


Figure 9-95. Fuze, Antidisturbance, Mine, ACS-52.

Dimensions	Case	Internal action	Operating force
Diameter: upper 1.7" Diameter: lower 2.8" Height: 7.8"	Plastic	Mechanical	Various

- a. *General.* The case is made of plastic.
- b. *Use.* The fuze is used primarily in the SACI antitank mine.

c. *Functioning.* The fuze may be set to function by pressure; pressure and pull, and twist.

Pressure Acutation. A force of about 300 to 450

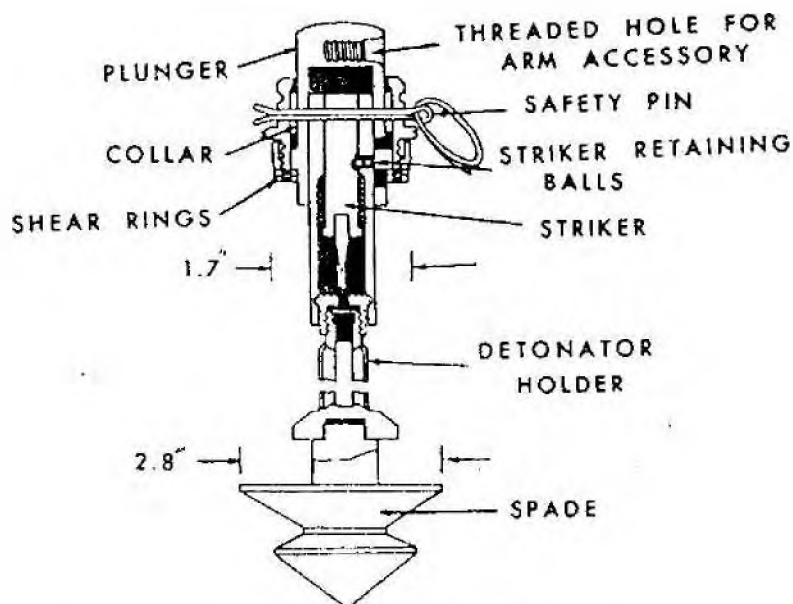


Figure 9-96. Fuze, Antidisturbance, Mine, ACS-52.

lb on the head of the fuze causes the shear rings to fracture and the plunger to move downward. This action frees the striker-retaining balls and allows the spring-loaded striker to fall on and fire the detonator.

Pull. Any attempt to remove the mine from the ground or remove the top part of the fuze brings a slot in the plunger into position to release the striker-retaining balls, thus starting the firing chain.

Twist. Turning the head of the fuze brings a slot in the plunger into position to release the striker retaining balls, thus starting the firing chain.

d. Installing and Arming.

Pressure Actuation:

(1) Inspect the fuze and insure that the proper shear rings are in place. (The thicker ring shears at 260 to 300 pounds pressure; the thinner ring shears at about 44 pounds pressure. Both are normally used for antitank employment.)

(2) Make sure that both blocking screws A and B are in position.

(3) Remove lower part of fuze and install an OTO detonator.

(4) Reassemble the two parts of the fuze and install it in the mine.

(5) Carefully remove the safety pin.

Pressure and Pull Actuation:

(1) Same as for pressure actuation, (1) above;

(2) Remove blocking screw B, and be sure screw A is in place;

(3) Same as for pressure actuation, (3), (4), and (5), above.

Pressure, Pull and Twist Actuation:

(1) Same as for pressure actuation, (1), above;

(2) Remove both blocking screws A and B;

(3) Same as for pressure actuation, (3), (4), and (5) above.

e. Disarming. This fuze cannot be neutralized; mines using it should be destroyed in place.

9-60. Fuze, Pressure, PMC-43 (Italy)

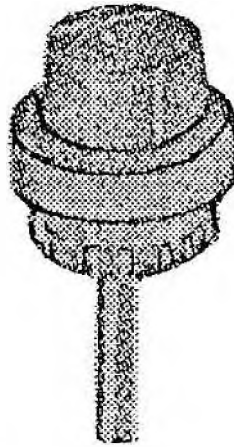


Figure 9-97. Fuze, Pressure, PMC-43.

Dimensions	Case	Internal action	Operating force
Diameter: 1.2" Height: 1.4"	Synthetic resin	Mechanical	30 lb

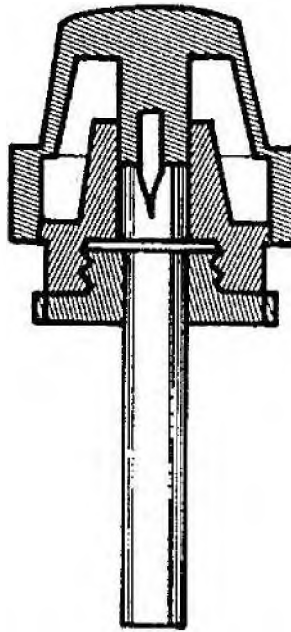


Figure 9-98. Fuze, Pressure, PMC-43.

a. General. The explosive in the fuze is the OTO detonator. The fuze is undetectable.

b. Use. The fuze is used with standard and improvised antipersonnel mines.

c. Functioning. Pressure on top causes the serrated annular section to rupture and the plunger fitted with a metallic striker is forced down on the OTO detonator firing it.

9-61. Fuze, Pressure, M42 (Italy)

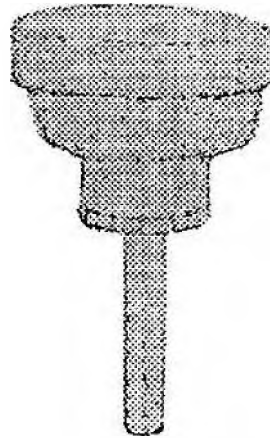


Figure 9-99. Fuze, Pressure, M42.

Dimensions	Case	Internal action	Operating force
Diameter: 1.5" Height: 1.2"	Synthetic resin	Mechanical	220 lb.

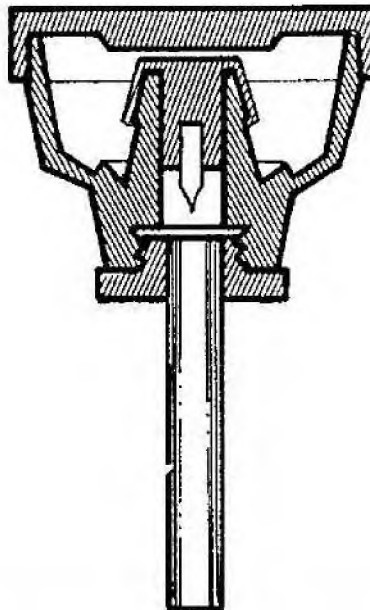


Figure 9-100. Fuze, pressure, M42.

- a. General.* The fuze is nonmagnetic.
- b. Use.* The fuze is used with the following AT mines:
 CS 42/2
 CS 42/3
 CC&B
- c. Functioning.* Under pressure, the top of the

case shatters and pressure is placed on the plunger. The plunger retaining shoulder is forced over the supporting lip and fails. The striker is forced down and detonates the cap-detonator.

d. Installing and Arming. The fuze is armed by attaching the OTO detonator by the retaining collar.

9-62. Mine, Antitank, Nonmetallic, Type 63 (Japan)



Figure 9-101. Mine, Antitank, Nonmetallic, Type 63.

Dimensions	Wt	Fuz	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 8 1/2"	Less than 35 lb	Pressure	400 lb	Composition B 24.2 lb.	No data

a. *General.* The model (type) 63 antitank mine is a round, molded, nonmetallic mine and is similar in size and shape to the US M15 heavy antitank mine. It has performance and lethality comparable to, or better than, the US M19 nonmetal-

lic M15 antitank mine. Rubber seals and gaskets insure waterproof operations for underwater use also. The bottom of the mine has 3 identical sized capped holes—one cap of which has an additional plug probably for an antilift device.

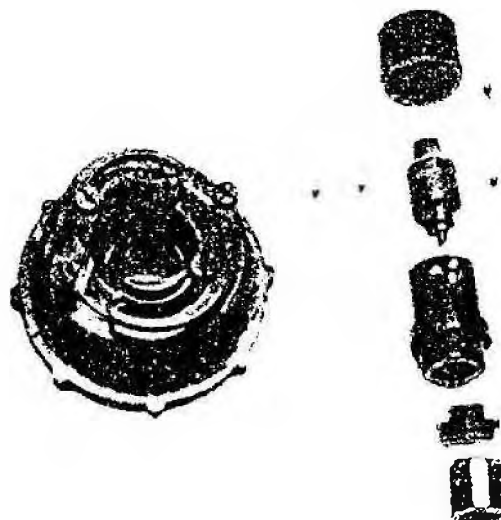


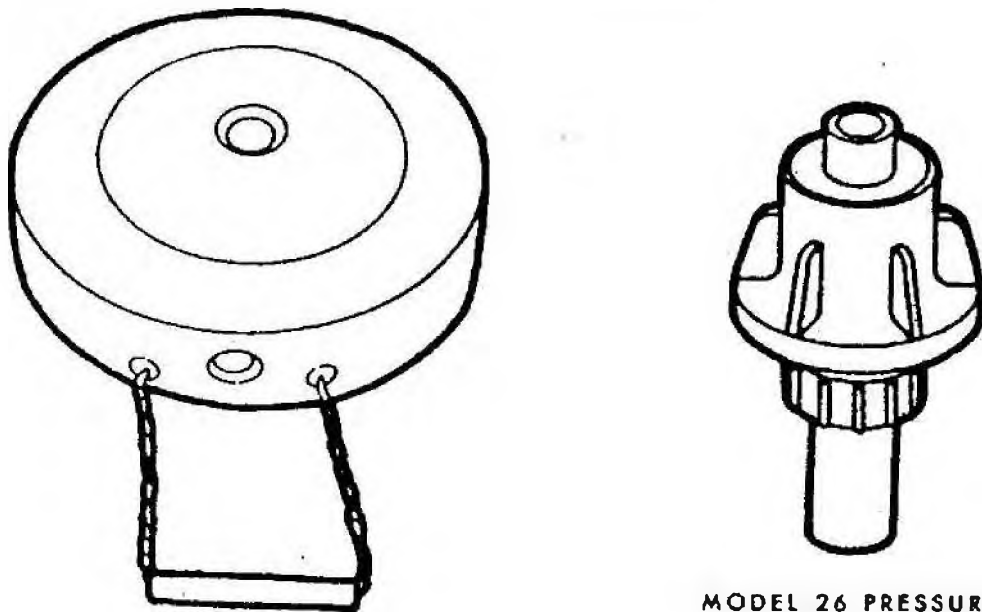
Figure 9-102. Mine, Antitank, Nonmetallic, Type 63.

b. Functioning. The model 63 antitank mine has a pressure-actuated fuze similar in appearance to the US XM608 fuze, but functions only on pressure. The pressure plate compresses on a hard rubber collar acting like a Belleville spring. This pressure is applied to the balls retaining the firing pin and forces the pin past the steel balls and

downward initiating the booster which sets off the main charge. The fuze is normally carried separately, with a spring clip insuring positive safety.

c. Installing and Arming. The spring clip is removed upon insertion of the fuze into the mine. The mine remains safe for handling until the arming knob is turned to the "armed" position.

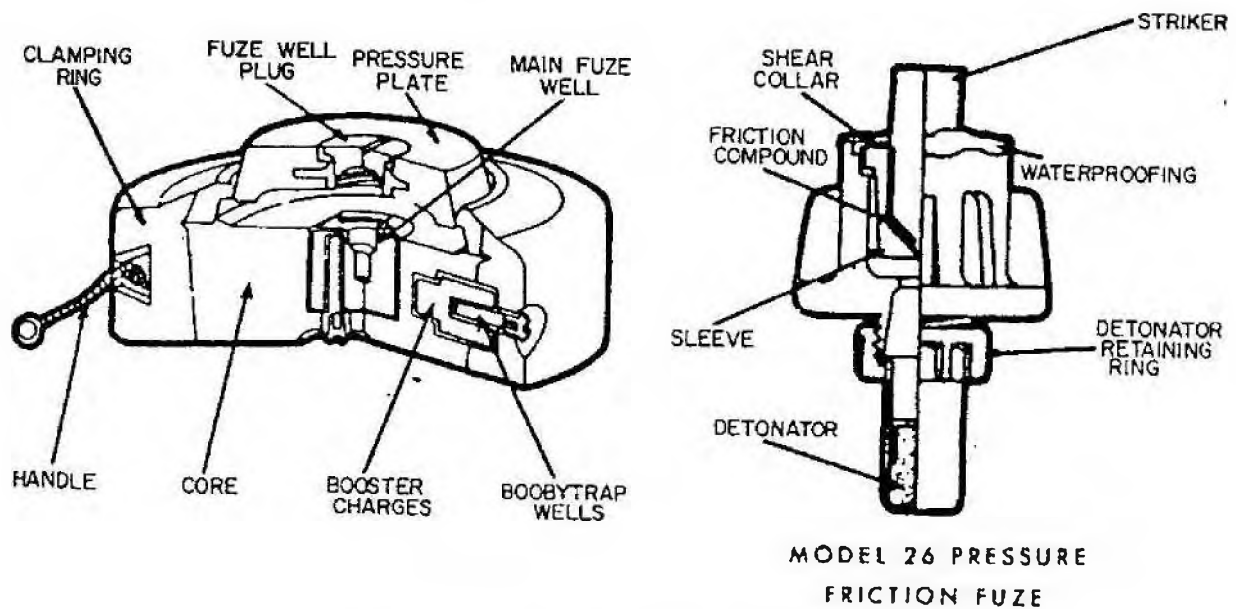
9-63. Mine, Antitank, Undetectable, Model 26 (Netherlands)



MODEL 26 PRESSURE
FRICTION FUZE

Figure 9-103. Mine, Antitank, Undetectable, Model 26.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.7" Height: 4.44"	19.8 lb	Model 26 pressure- friction with shear collar safety.	770 lb.	19.8 lb	No data



MODEL 26 PRESSURE
FRICTION FUZE

Figure 9-104. Mine, Antitank, Undetectable, Model 26.

a. General. This mine resembles the French antitank mine Model 1951. Except for a few fittings it is composed entirely of explosive (cast TNT reinforced with glass wool). The main charge is in three parts—a pressure plate section, a central core, and a clamping ring that holds the first two parts together. The mine has two booster charges—one located on the central axis that serves both the main fuze well and the bottom boobytrap well and the other located on a radial axis that serves the second boobytrap well. A screw plug in the center of the pressure plate gives access to the main fuze well.

b. Use. The Model 26 undetectable antitank mine is laid in conventional minefields and other obstacles to damage tracks and suspension systems of armor.

c. Functioning. Pressure on the top causes the pressure plate to separate along the shear groove and bear down on the fuze. The shear collar on the fuze then falls and the friction compound

flashes and fires the detonator. The detonator fires the booster charge and in turn the main charge.

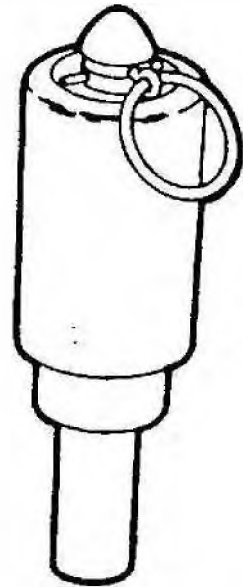
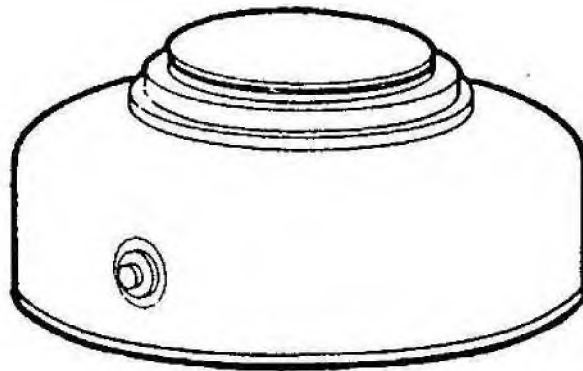
d. Installing and Arming.

- (1) Remove the main fuze-well access plug.
- (2) Place a pressure friction fuze, Model 26, with a detonator attached, in the well.
- (3) Replace the fuze-well access plug, making sure the rubber gasket is in place. (The letter on the plug (H, N, or B) must be the same as the letter on the mine; for greater safety, the same plug that is removed from the mine should be returned to it.)

e. Disarming.

- (1) Search for and remove any antilift devices.
- (2) Remove the main fuze-well access plug.
- (3) Remove the fuze.
- (4) Separate the detonator from the fuze.
- (5) Remove the mine and fuze to a safe storage or disposal area.

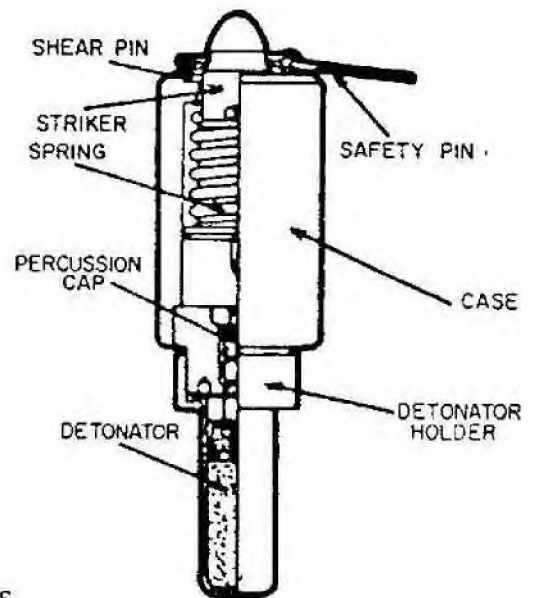
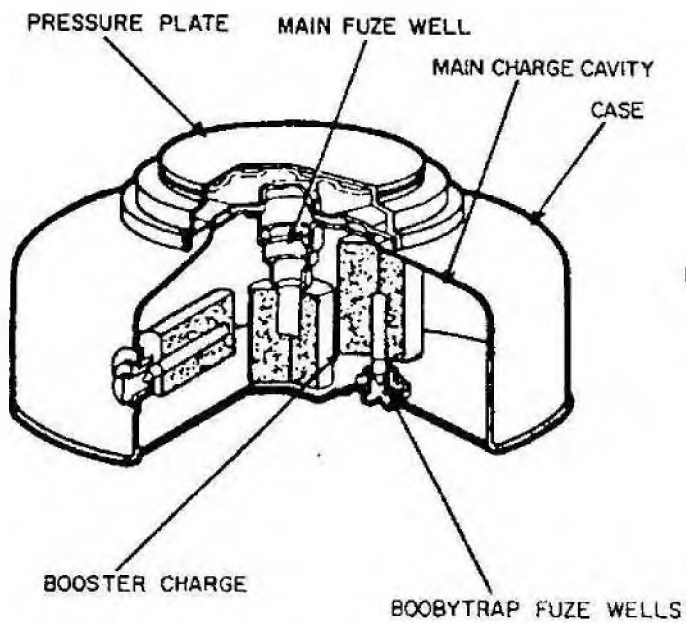
9-64. Mine, Antitank, Model 25 (Netherlands)



MODEL 29 FUZE

Figure 9-105. Mine, Antitank, Model 25.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 5.03"	28.6 lb	Model 29 pressure, with shear wire release.	550 to 770 lb	19.8 lb TNT	3 charges



MODEL 29 FUZE

Figure 9-106. Mine, Antitank, Model 25.

a. General. This conventional steel-cased mine resembles the World War II German Tellermine 43 and the French metallic model 1948, but has a considerably larger explosive charge. This mine has two secondary fuze wells; one in the side of the mine and one in the bottom. It has a main charge and three booster charges—one surrounding each of the two boobytrap wells and the main fuze well. A pressure plate is placed over the main fuze well, which is located in the center of the top surface of the case.

b. Use. This mine is employed in conventional minefields to damage tracks and suspension systems of armored vehicles.

c. Functioning. The weight of a moving vehicle forces the pressure plate down onto the fuze, shearing the shear pin. This action releases the spring-loaded striker, firing the mine.

d. Installing and Arming.

(1) Remove the pressure plate and the fuze well plug.

(2) Remove the safety pin from a pressure fuze Model 29 (with the detonator attached).

(3) Place the fuze in the well.

(4) Replace the pressure plate.

e. Disarming (f below).

(1) Search for and remove any secondary fuzes or antilift devices.

(2) Remove the pressure plate.

(3) Insert a safety pin in the fuze.

(4) Remove the fuze from the mine.

(5) Take mine and fuze to safe storage or disposal area.

f. Precaution. As this mine is similar to the German Tellermines, it should be considered armed with an antilift or antidisturbance fuze. *Disarming should not be attempted unless the tactical situation demands it.*

9-65. Mine, Antitank, Type 2, T40 (Netherlands)

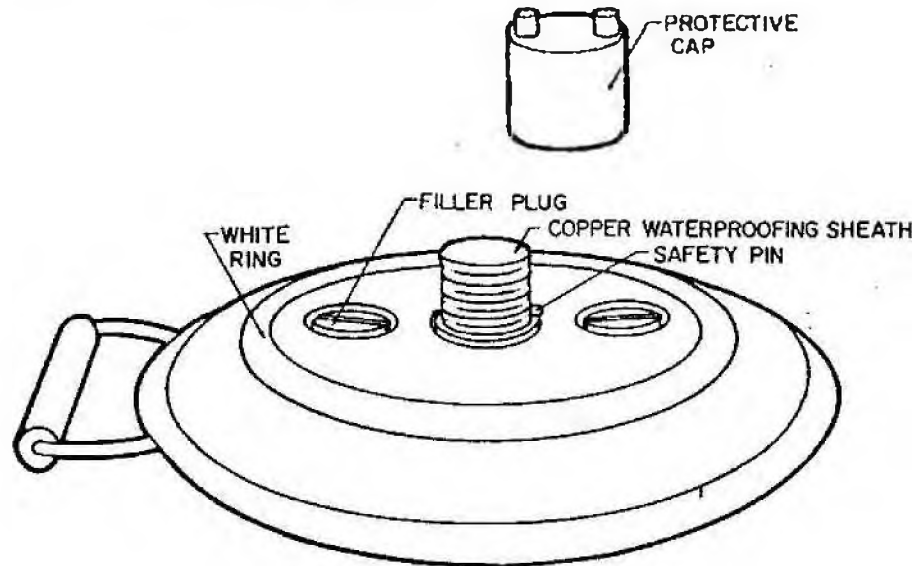


Figure 9-107. Mine, Antitank, Type 2, T40.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11" Height: 3 1/4"	13.2 lb	Pressure	100 lb	9 lb TNT	No data

a. *General.* The body of the mine consists of 2 dished steel pressings fitted together with a water-tight joint. Two filler plugs are located on the top, as is a central socket for the igniter and detonator.

b. *Use.* The mine is designed for use in the

low-lying wetlands of the Netherlands, and is waterproof.

c. *Functioning.* Pressure exerted on the waterproofing fuze cover crushes it, depresses the plunger and plunger housing, and compresses the striker spring. When the recess in the plunger

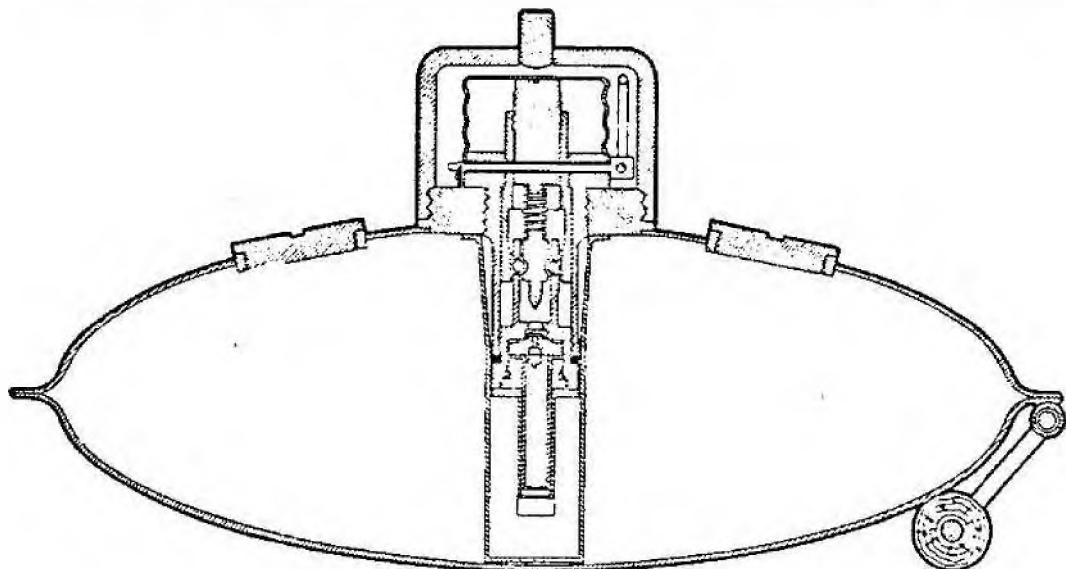


Figure 9-108. Mine, Antitank, Type 2, T40.

housing is opposite the striker-release balls, the balls escape into the recess, releasing the spring-loaded striker to fire the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

- (1) Remove the protective cap.
- (2) Screw the detonator into the base of the fuze.
- (3) Screw the fuze into the mine.
- (4) Pull the safety pin.

e. Disarming.

- (1) Check for and remove any antilift devices.
- (2) Insert a safety-wire into the safety pin hole in the mine fuze.
- (3) Carefully unscrew the fuze from the mine.
- (4) Carefully unscrew the detonator from the fuze.

f. Precaution. There are no safety measures.

9-66. Mine, Antipersonnel, Nonmetallic, Model 22 (Netherlands)

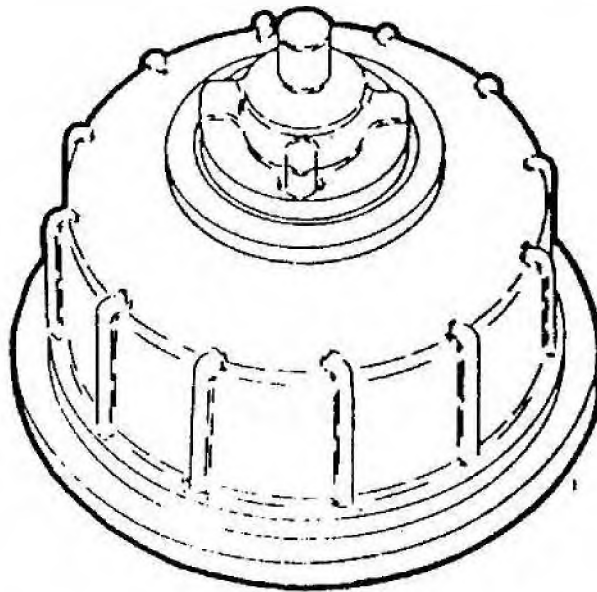


Figure 9-109. Mine, Antipersonnel, Nonmetallic, Model 22.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.8" Height: 1.9"	3 oz	Model 22 pressure- friction.	11 to 55 lb.	1.4 oz TNT	N/A

a. General. This mine resembles the French antipersonnel mine Model 1951. It has four parts—a plastic case, an integral fuze, a main charge, and a detonator. The case has vertical ribs on its sides for strengthening purposes. The threaded well in the top is provided for the pressure shear type friction fuze.

b. Use. These mines are emplaced in large numbers for antipersonnel use. Only the top of the striker extends above the ground.

c. Functioning. Pressure on the top of the fuze striker causes the shear collar to fail, which forces the striker, charged with a friction compound, into a mating sleeve. The abrasion causes the friction compound to flash, which sets off the detonator and then the main charge.

d. Installing and Arming.

- (1) Unscrew the fuze.
- (2) Insert a detonator in the mine.

- (3) Replace the fuze.
- (4) Emplace the mine.

e. Disarming.

- (1) Unscrew the fuze from the mine.
- (2) Remove the detonator from the mine.
- (3) Remove the mine and fuze to a safe storage or disposal area.

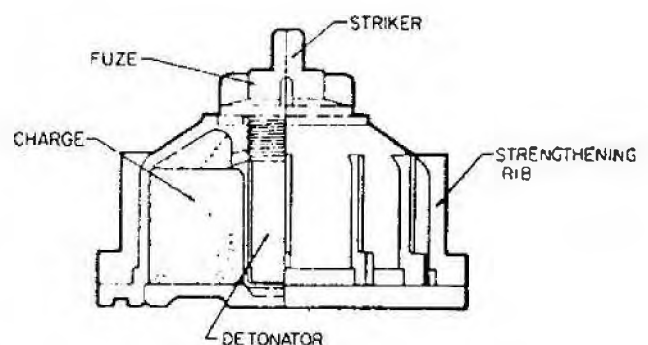


Figure 9-110. Mine, Antipersonnel, Nonmetallic, Model 22.

9-67. Mine, Antipersonnel, Nonmetallic, Model 15 (Netherlands)

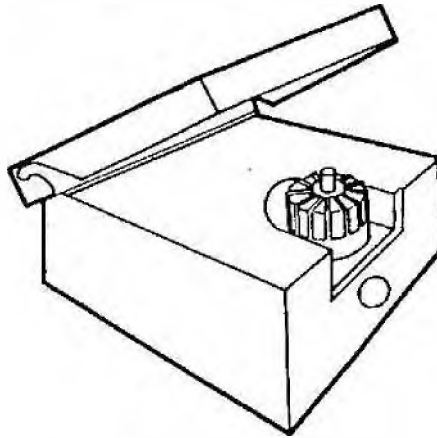


Figure 9-111. Mine, Antipersonnel, Nonmetallic, Model 15.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 4.4" approx. Width: 3.9" approx. Height: 2.6" approx.	1.32 lb.	Pressure Chemical M 15	13-55 lb	6.2 oz TNT	None

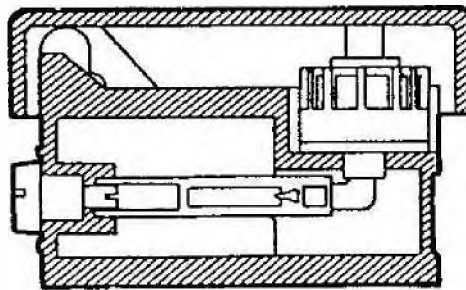


Figure 9-112. Mine, Antipersonnel, Nonmetallic, Model 15.

a. *General.* The mine uses the pressure igniter No. 15 and has a plastic case. One fuze well is located in the top. This is a blast type mine.

b. *Functioning.* A pressure of 13-55 pounds applied to the mine cover crushes the chemical ampule in the Model 15 fuze.

c. *Installing and Arming.*

- (1) Take lid off mine.

- (2) Insert primer (with open side of primer towards igniter).

- (3) Place mine in hole dug 1¼" to 2" deep.

- (4) Screw pressure igniter No. 15 down.

- (5) Carefully fix pressure lid.

- (6) Cover the mine with dirt.

d. *Disarming.*

- (1) Take lid off mine.

- (2) Remove primer and igniter.

f. *Precaution.* The mine cannot be set "safe".

9-68. Fuze, Pressure-Friction, Nonmetallic Model 26 (Netherlands)

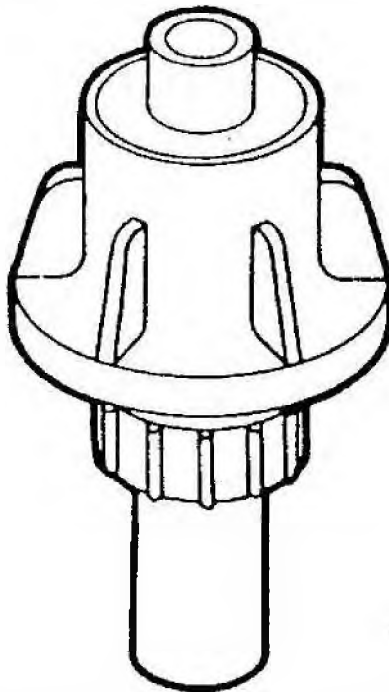


Figure 9-113. Fuze, Pressure-Friction, Nonmetallic Model 26.

Dimensions	Case	Internal action	Operating force
Diameter: 1.17" Height: 2.18" with detonator	Plastic	Friction with shear collar release.	83 to 110 lb.

a. General. The Model 26 resembles closely the French Model 1952 pressure-friction fuze. The cylindrical case is made of plastic with vertical ribs molded therein to add strength. It has the overall appearance of a truncated cone. It is fired by a striker, which is charged with a friction compound, and which is forced into a mating sleeve. The striker is held in position by a shear collar. The detonator holder screws to the base.

b. Use. This fuze is used in the Model 26 undetectable antitank mine.

c. Functioning. Pressure on the top of the fuze ruptures the shear collar, which moves the striker into the mating sleeve, where the abrasion of the friction compound causes a flash that sets off the detonator.

d. Installing and Arming.

- (1) Attach the detonator to the fuze.
- (2) Place the fuze and detonator in the mine.

e. Disarming.

- (1) Remove the fuze and detonator from the mine.
- (2) Remove the detonator from the fuze.
- (3) Transport the fuze and mine to a safe storage or disposal area.

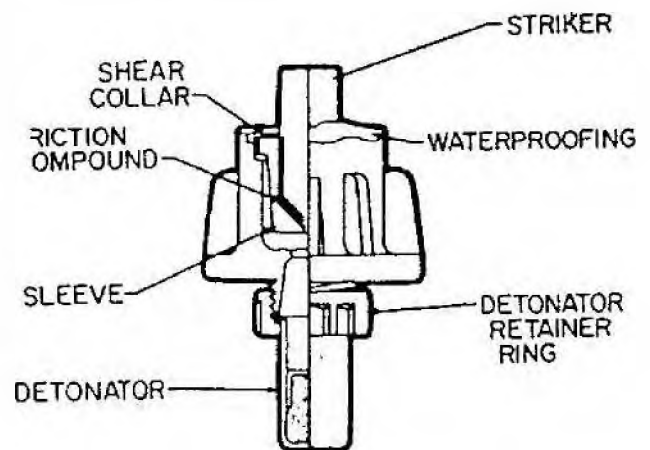


Figure 9-114. Fuze, Pressure-Friction, Nonmetallic Model 26.

9-69. Fuze, Pressure-Friction, Nonmetallic, Model 22 (Netherlands)

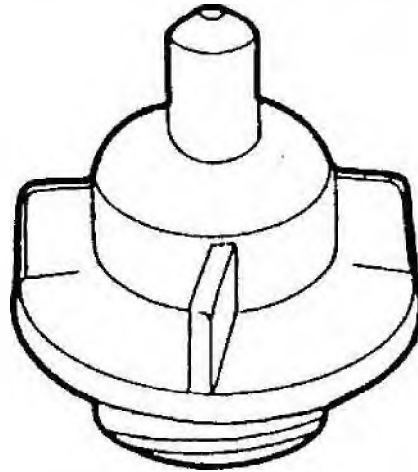


Figure 9-115. Fuze, Pressure-Friction, Nonmetallic, Model 22.

Dimensions	Case	Internal action	Operating force
Diameter: 0.89" Height: 0.81"	Plastic	Pressure-friction with shear collar.	11 to 55 lb.

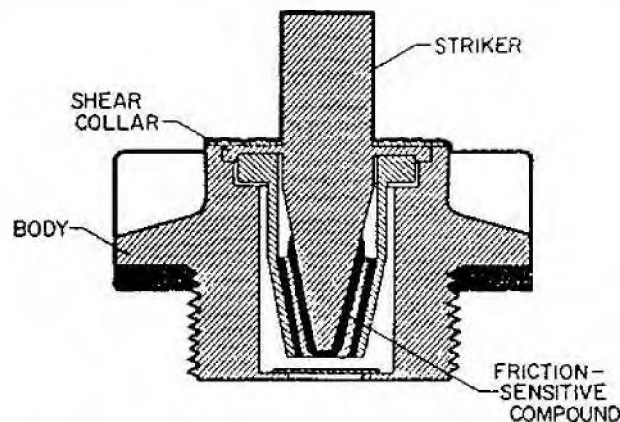


Figure 9-116. Fuze, Pressure-Friction, Nonmetallic, Model 22.

a. General. This fuze has a plastic body, a cone-shaped cup, and a striker with an integral shear collar. The lower end of the striker is conical, to mate with the cup, and both conical surfaces have been coated with a friction-sensitive compound.

b. Use. This fuze is used in the model 22 anti-personnel mine.

c. Functioning. Pressure of a man's foot on top of the fuze striker causes the striker to move downward and break the shear collar and force

the compound-coated striker into the mating sleeve, causing a flame that detonates the mine.

d. Installing and Arming.

- (1) Unscrew the fuze from the mine.
- (2) Insert the detonator and replace the fuze.

e. Disarming.

- (1) Unscrew the fuze from the mine.
- (2) Remove the detonator.
- (3) Replace the fuze.

f. Precaution. Fuze cannot be set in a "safe" position.

9-70. Fuze, Pressure, No. 15 (Netherlands)

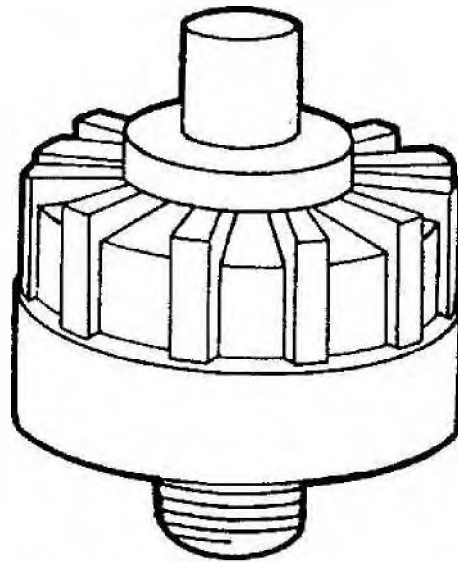


Figure 9-117. Fuze, Pressure, No. 15.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	Bakelite	Pressure	13-55 lb.

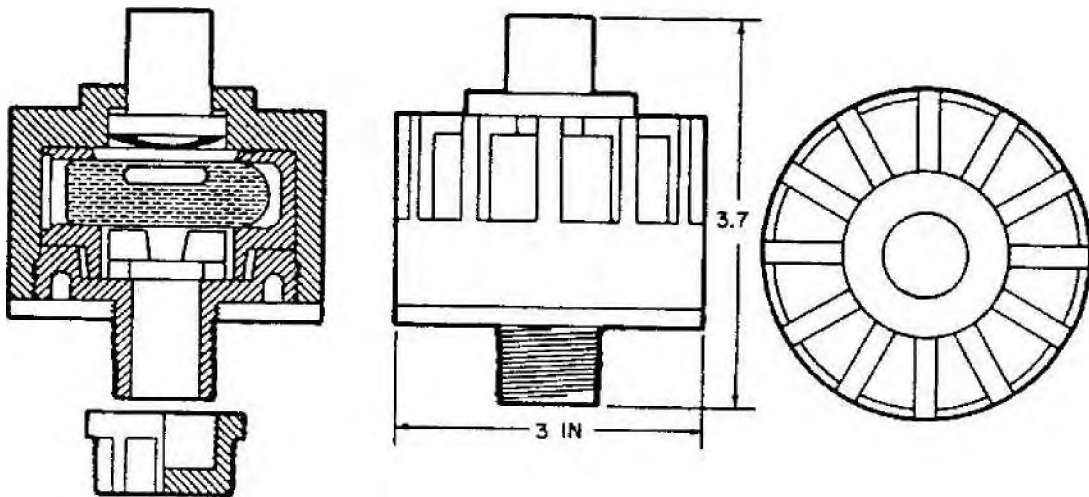


Figure 9-118. Fuze, Pressure, No. 15.

- a. General. The fuze has a transport cap.
- b. Use. The fuze is used with AP mine No. 15
- c. Functioning. A pressure of 13-55 pounds on

pressure pin crushes the ampule. The acid and powder then ignite and, in turn, ignite the primer.
d. Precaution. It is not possible to set the fuze in a "safe" position.

9-71. Fuze, Pressure, PW-2 (Netherlands)

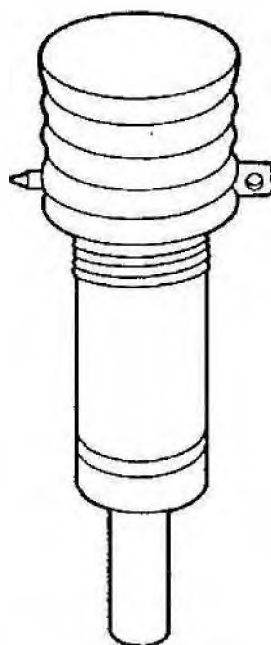


Figure 9-119. Fuze, Pressure, PW-2.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	Metal	Pressure mechanical, with ball release.	165 lb.

a. General. The fuze has a protective cap, a corrugated copper waterproofing sheath, a safety pin, a spring-loaded striker, a plunger housing, and a percussion cap and detonator assembly that screws into the bottom of the fuze case.

b. Use. This fuze is used in the Type 2 (T-39 or T-40) antitank mine.

c. Functioning. Pressure exerted on the waterproofing fuze cover crushes it, depresses the plunger, and plunger housing, and compresses the striker spring. When the recess in the plunger housing is opposite the striker-release balls, the balls escape into the recess, releasing the spring-loaded striker to fire the percussion cap, detonator, booster, and main charge.

d. Installing and Arming.

- (1) Remove the protective cap.
- (2) Screw the detonator into the base of the fuze.
- (3) Screw the fuze into the mine.
- (4) Pull the safety pin.

e. Disarming.

- (1) Check for and remove any antilift devices.
- (2) Insert a safety wire into the safety pin hole in the mine fuze.
- (3) Carefully unscrew the fuze from the mine.
- (4) Carefully unscrew the detonator from the fuze.

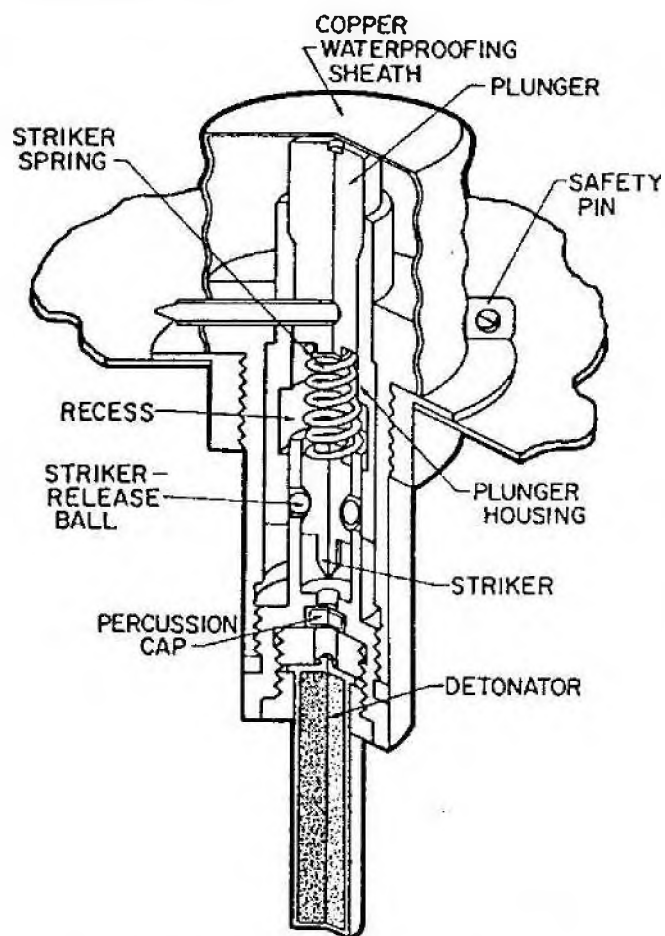


Figure 9-120. Fuze, Pressure, PW-2.

9-72. Mine, Antitank C.E.T.M.E. (Spain)

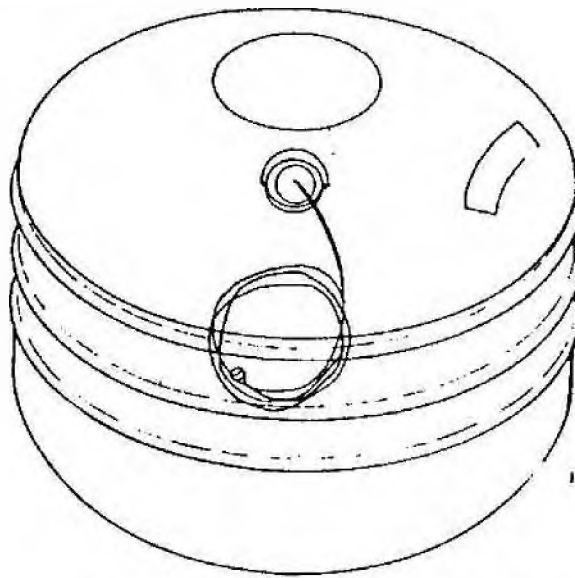


Figure 9-121. Mine, Antitank C.E.T.M.E.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 18" Height: 6"	22 lb approx.	Chem. or mech.	No data	11.5 lb TNT approx.	No data

a. General. The mine has a bakelite case and is laid by hand. It is fitted with an antiremoval device. It can be altered by shear discs. The mine can be activated by either a chemical or mechanical fuze.

c. Functioning. A hydraulic-damped time response principal is applied. The downward movement of the pressure plate is retarded by three hydraulic cylinders, which make the mine resist-

ant to mechanical and explosive mine clearing devices.

d. Installing and Arming.

(1) Remove the safety disk from the fuze and insert the fuze into the mine.

(2) Emplace the mine.

(3) Remove the safety pin from the fuze.

e. Disarming. Detonate the mine in place: do not attempt to disarm it.

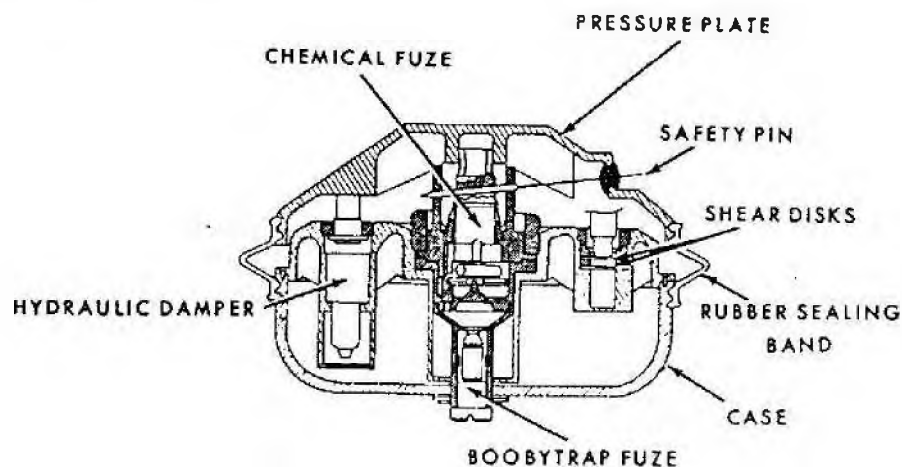


Figure 9-122. Mine, Antitank C.E.T.M.E.

9-73. Mine, Antipersonnel, Model FAMA (Spain)

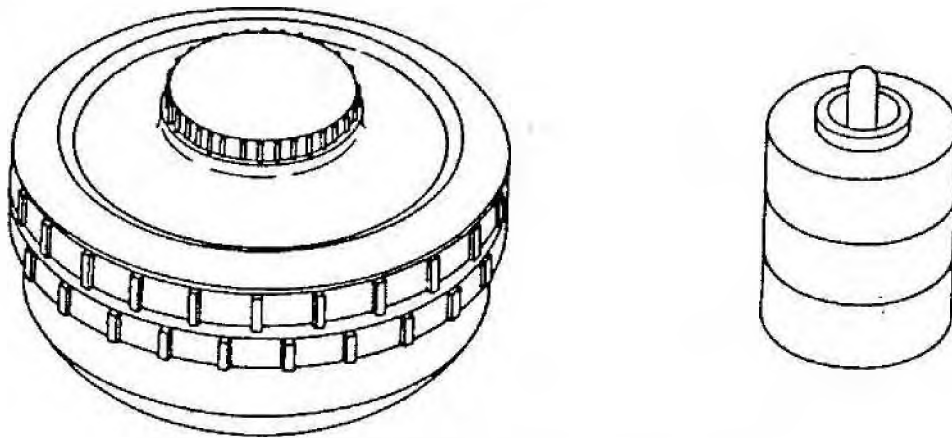


Figure 9-123. Mine, Antipersonnel, Model FAMA.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.7" Height: 1.4"	3.4 oz	Pressure	66 lb.	1.75 oz TNT or tetryl.	No data

a. General. The FAMA is an undetectable blast type mine composed of a plastic case, a fuze, and an explosive charge. The upper cover has a stress concentration or shear groove molded into it.

b. Use. This mine is employed in antipersonnel and antitank mine fields.

c. Functioning. Pressure applied to the case of the mine causes the upper cover to break along

the shear groove. The inner portion moves downward until it contacts the firing pin plunger which shears at a shear collar driving the firing pin into the primer to detonate the mine.

d. Installing and Arming.

- (1) Remove the fuze well cover.
- (2) Remove the transit cap from the fuze and

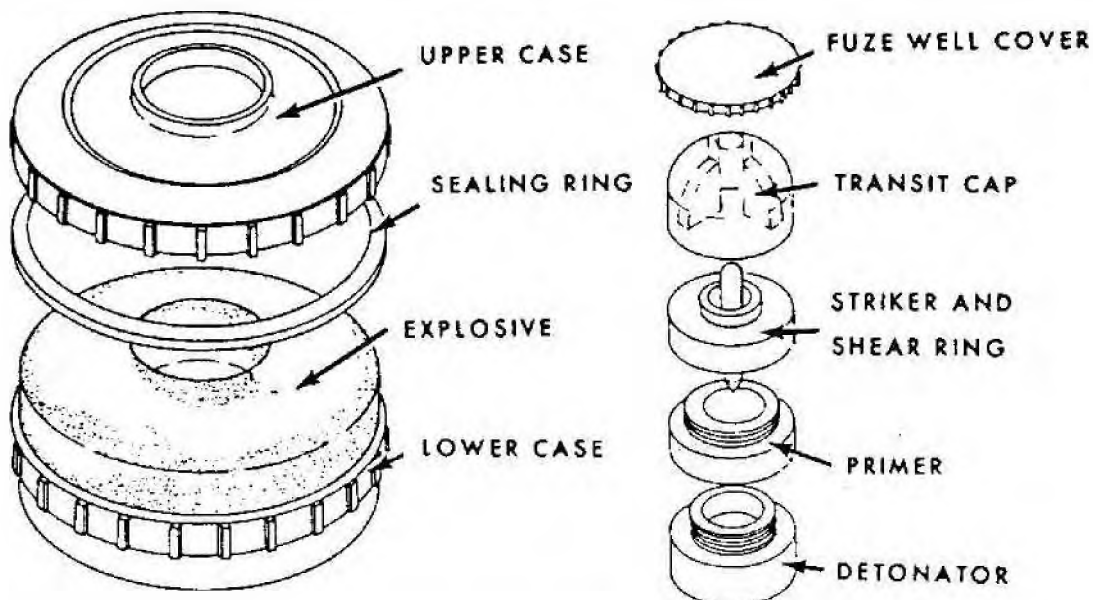


Figure 9-124. Mine, Antipersonnel, Model FAMA.

insert the fuze into the mine, striker end up (firing pin pointing down).

(3) Replace the well cover.

e. *Disarming.*

(1) Remove the fuze well cover.

(2) Remove the fuze from the mine.

(3) Take the mine and fuze to a safe storage or disposal area.

9-74. Mine, Antipersonnel M45B (Spain)

Illustration furnished for identification.



Figure 9-125. Mine, Antipersonnel M45B.

9-75. Mine, Antipersonnel CP-X.02 (Spain)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.8" Height: 1.3"	2.6 oz	E. P.-01(a)	30 lb.	1.4 oz	N/A

General. This is the "Mine Indetectable (Cardona)" Model CP-X.02. The mine has a bakelite

case and is completely nonmetallic. The fuze force can be changed.

9-76. Mine, Antipersonnel, H-1 (Spain)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 7.4" Height: 4.6"	No data	Pressure	No data	No data	N/A

9-77. Fuze, Pressure, FAMA (Spain)

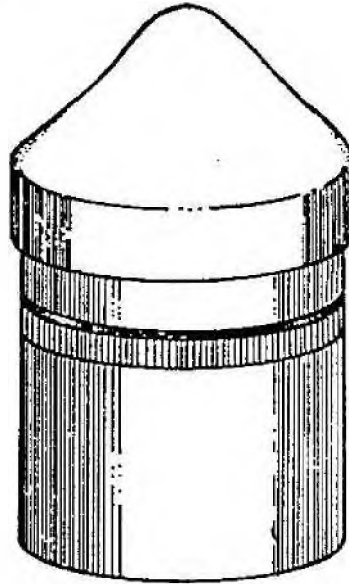


Figure 9-126. Fuze, Pressure, FAMA.

Dimensions	Case	Internal action	Operating force
Diameter: 0.7" Height: 0.9"	Plastic	No data	No data

a. General. The fuze is made of plastic and weighs $\frac{1}{4}$ oz.

b. Use. The fuze is used with antipersonnel mines.

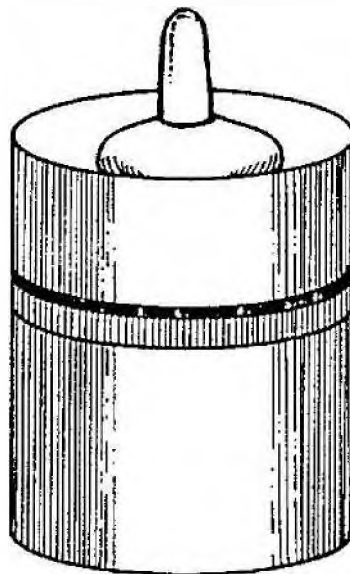


Figure 9-127. Fuze, Pressure, FAMA.

9-78. Mine, Antitank, Model 5 (Sweden)

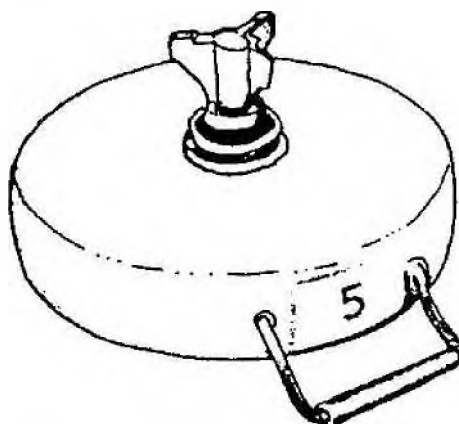
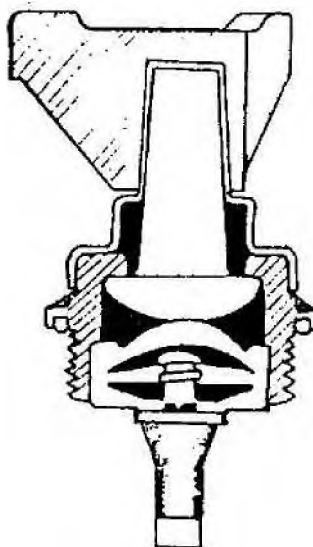


Figure 9-128. Mine, Antitank, Model 5.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 13.2" Height: 6.4" w/fuze	22 lb.	Press-tilt	617 lb.	Hexatol RDX/ TNT 50/50	

General. The mine has 1 main fuze well at the top. The mine is made of glass fiber reinforced explosive and is the blast type.



FUZE PRESS-TILT

Figure 9-129. Mine, Antitank, Model 5.

9-79. Mine, Antitank, Model 52 (Sweden)

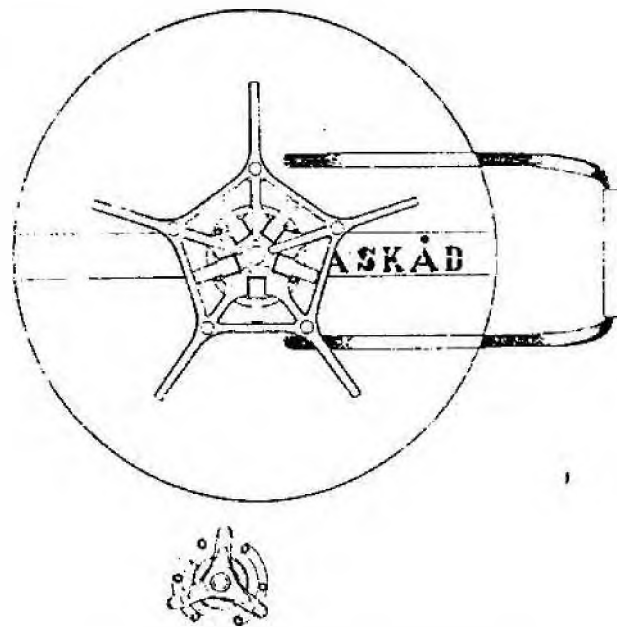


Figure 9-130. Mine, Antitank, Model 52.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 13.5" Height: 3.0"	19.8 lb	Pressure	550 lb (32 lb with tilt rod)	TNT 16.5 lb.	No data

a. General. This mine has a case of molded plywood, covered with waterproofed fabric and is fitted with a carrying handle. The main fuze well is centrally located in the top of the case and uses the pressure fuze Model 47. There are no supplementary fuze wells for boobytrapping. Three types of pressure pieces may be used with the mine: A pentagonal spider; a small three-pronged pressure piece; or a tiltrod. This is believed to be a standard Swedish mine.

b. Functioning. Force on the pressure piece crushes the head of the fuze, causing its shear pin to fail. The fuze plunger moves downward, allow-

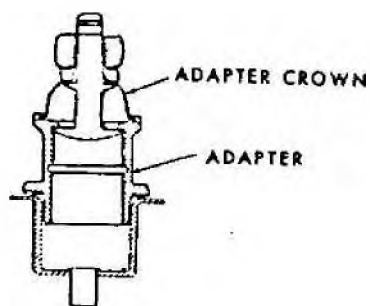
ing the striker-retaining balls to escape. The freed striker fires the detonator that, in turn, detonates the main charge.

c. Installing and Arming.

- (1) Remove the pressure piece.
- (2) Remove the dummy fuze from the well.
- (3) Place a Model 47 fuze with detonator attached in the well.
- (4) Replace the pressure piece.

d. Disarming.

- (1) Check for and remove any boobytraps.
- (2) Follow arming procedure in reverse.



ADAPTER m/49

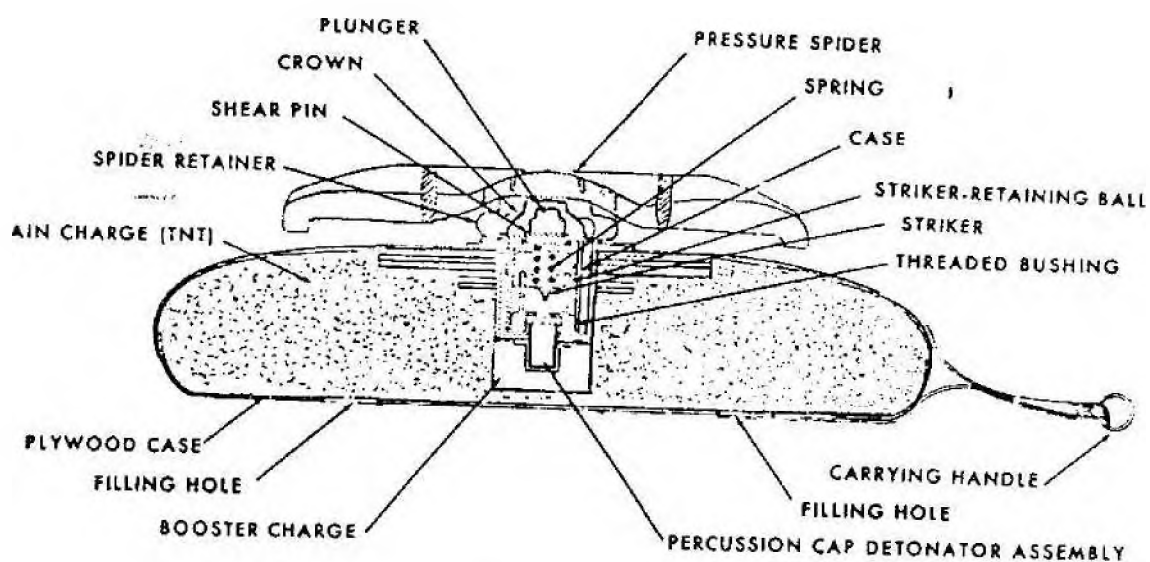


Figure 9-131. Mine, Antitank, Model 52.

9-80. Mine, Antitank, M1 101 (Bofors) Nonmetallic (Sweden)



Figure 9-132. Mine, Antitank, M1 101 (Bofors) Nonmetallic.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 6.25"	27.5 lb	No data	No data	24.5 lb TNT or hexotol (RDX/TNT 50/50)	Pressed hexotol

a. General. This blast type mine is nonmetallic and has no casing. Thus, it cannot be located with an electrical mine detector. The body of the mine is molded of TNT or hexotol and is reinforced with fiberglass. The booster is integral with the main charge. A fuze well, centrally located in the top of the explosive, is fitted with a threaded plastic fuze-well insert. This insert serves as a means of securing the combination pressure spider and fuze to the mine. A cord carrying handle is affixed to the mine body.

b. Functioning. Sufficient weight applied on the pressure spider depresses the plunger, exerting its force on the shear disk. Its failure brings pressure on the striker body, which is pushed downward transferring its force to the Belleville spring. The spring snaps downward, driving the striker point

against the percussion cap and initiating the firing chain.

c. Installing and Arming.

- (1) Emplace the mine.
- (2) Remove transport plug from fuze well.
- (3) Check detonator to be sure it is properly installed in fuze.
- (4) Screw fuze into mine.
- (5) Boobytrap if desired.
- (6) Cover mine.

d. Disarming.

- (1) Uncover mine.
- (2) Search for and remove any boobytraps.
- (3) Remove fuze from mine.

e. Precaution. A pressure-release fuze may be used to boobytrap the mine.

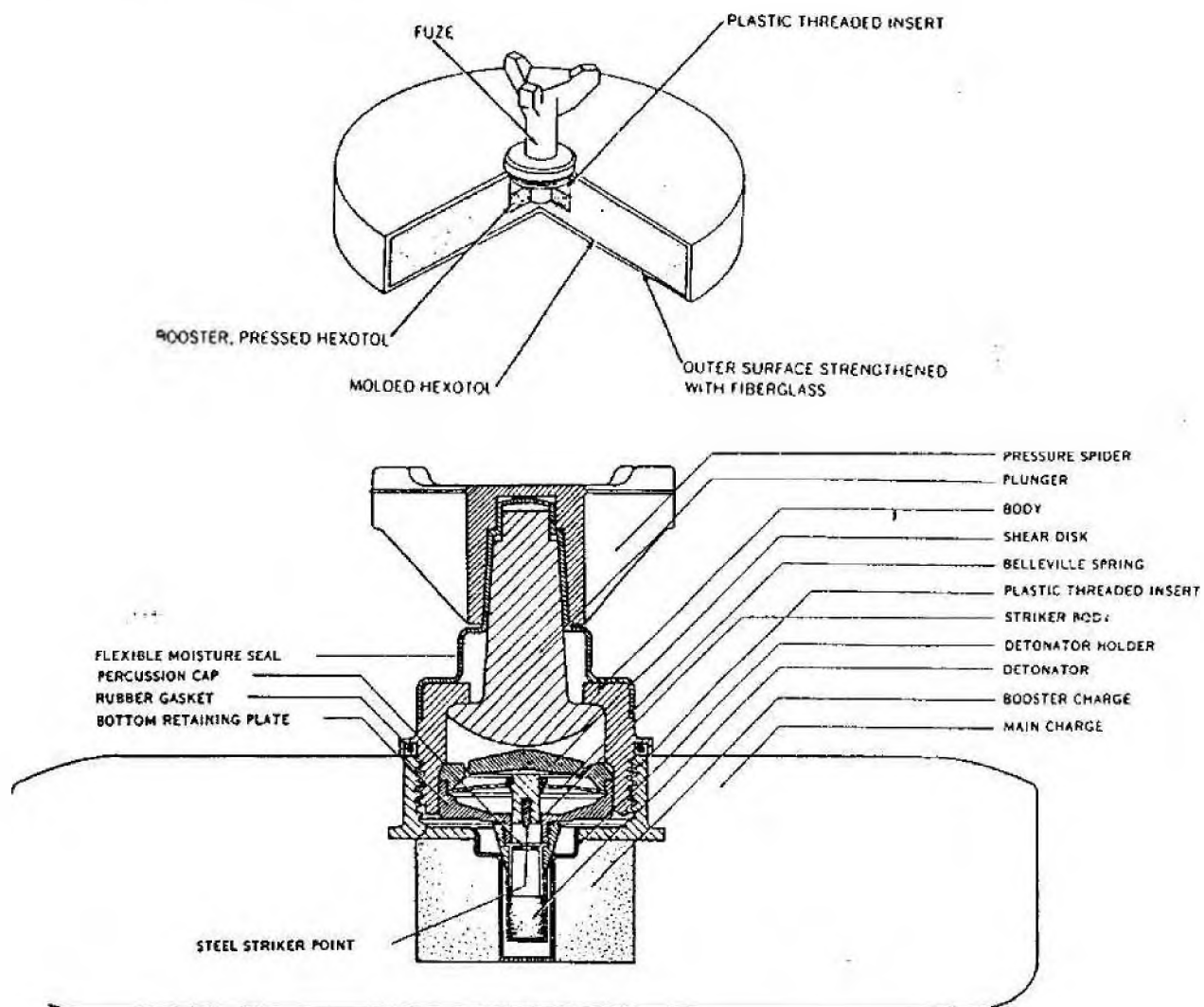


Figure 9-133. Mine, Antitank, M1 101 (Bofors) Nonmetallic.

9-81. Mine, Antitank, Models 41-47 and 47 (Sweden)

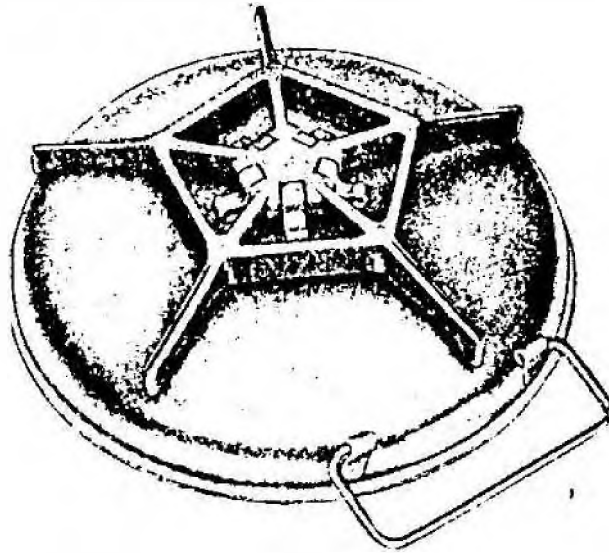


Figure 9-134. Mine, Antitank, Models 41-47 and 47.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 10.6" Height: 4.9" (w/spider)	No data	Pressure	440 lb at center, 880 lb at edge.	TNT 11 lb.	Pressed TNT

a. *General.* The two models vary in size and weight only. Each has a cylindrical metal case and a 5-armed pressure spider. The spider is supported by 5 metallic band attached to a collar that screws into the fuze well. The case is completely filled with explosive consisting of the main charge

and the booster charge located beneath the fuze well.

b. *Use.* This mine is used as a blast mine to damage the tracks and suspension system of armored vehicles.

c. *Functioning.* Pressure on the spider forces it

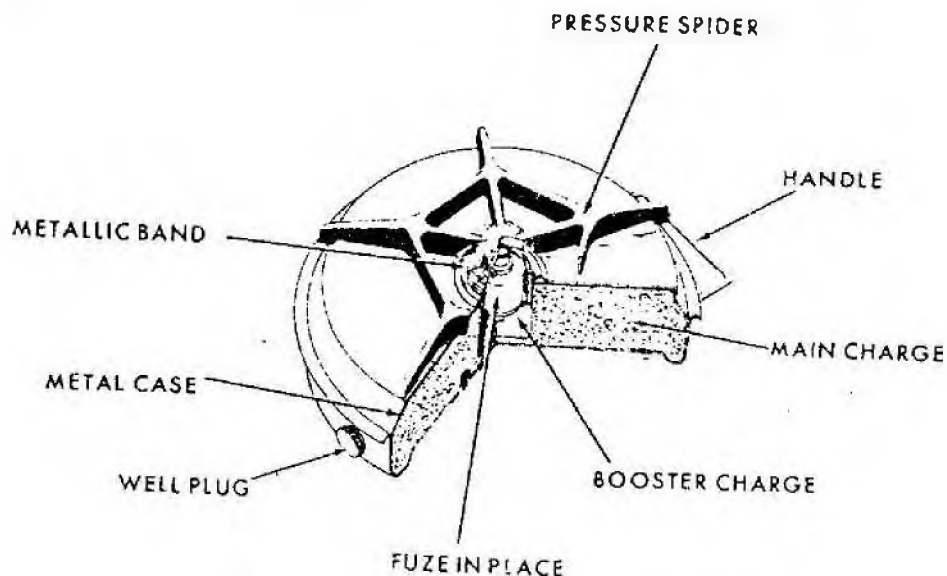


Figure 9-135. Mine, Antitank, Models 41-47 and 47.

down and the pressure is transmitted to the fuze. The fuze shearpin fails and the plunger moves downward, compressing the striker spring and allowing the retaining ball to escape. The striker is driven downward and fires the percussion cap and detonator assembly. The firing chain is carried through the booster to the main charge.

d. Installing and Arming.

- (1) Remove the pressure spider.
- (2) Remove the fuze well spider support and transit plug.

(3) Place a Model-47 fuze with detonator attached in the fuze well.

(4) Check the seating of the fuze with the checking device. If the fuze is seated properly, the checking cup should rest squarely on the rim of the fuze well.

(5) Replace the spider.

e. Disarming.

- (1) Check for and remove any boobytraps.
- (2) Follow arming procedure in reverse.

9-82. Mine, Antitank, FFV 028 (Sweden)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	No data	No data	No data	RDX/TNT or TNT.	No data

General. This is a magnetic effects mine with a hollow charge unit filled with RDX/TNT or TNT. The hollow charge unit is so designed that besides

perforation of the tank, a greater after effect is obtained within the vehicle which causes immobilization of the vehicle and crew.

9-83. Mine, Antitank 47b, c, and d (Sweden)

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 13.8" Height: 3.9"	19.8 lb	Pressure	500 lb	TNT 12.1 lb	No data

General. This is a blast type mine with 1 booster charge. It is circular in shape.

9-84. Mine, Antitank, Mi-102 (Sweden)

Dimensions	Wt	Fuz	Operating force	Explosive	
				Main charge	Booster
Diameter: 12.2" Height: 2.8"	17.6 lb	Press tilt, mech.	440 lb	Hexatol RDX/ TNT 50/50	No data

General. This is a blast type mine cylindrical in shape.

9-85. Mine, Airfield (Sweden)

Illustration furnished for identification

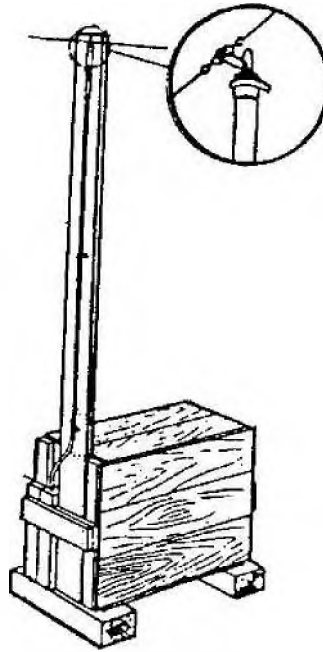


Figure 9-136. Mine, Airfield.

9-86. Mine. Antipersonnel Truppmina 9 (Sweden)



Figure 9-137. Mine, Antipersonnel Truppmina 9.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Max. Diameter: 1.4" Length: 7.5"	1.3 lb	M/48	4-11 lb	0.27 lb	N/A

a. *General.* This "mine" consists of a piece of pipe threaded to accept various fuzes. The effective fragmentation radius is about 10 meters.

b. *Use.* Several sections can be assembled into a small bangalore torpedo, or one section can be fuzed for use as a hand grenade or flare pistol.

9-87. Mine, Antipersonnel M49 and M49B (Sweden)

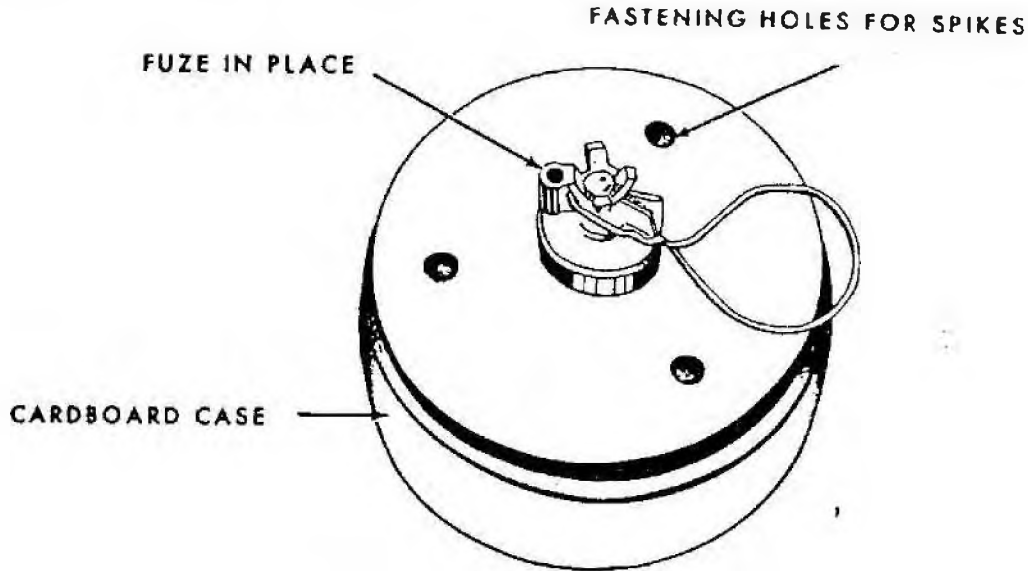


Figure 9-138. Mine, Antipersonnel M49 and M49B.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.94" Height: 2.15"	0.52 lb	Pressure	M49 fuze 15-29 lb M49B fuze 11-22 lb	TNT	N/A

a. *General.* This is a blast type mine with a cardboard case. Four axial holes completely traverse the mine from top to bottom surfaces. The largest hole is centrally located and serves as a fuze well. The other 3 holes are for fastening the mine to the ground.

b. *Use.* This mine is used in the conventional manner against foot troops.

c. *Functioning.* Pressure of 15 to 29 lb. or more causes the fuze plunger to pierce a light metal membrane and compress the striker spring. Continued pressure causes the striker-supporting lugs to fail and the striker is driven onto and fires the percussion cap. The cap sets off the detonator that, in turn, fires the main charge.

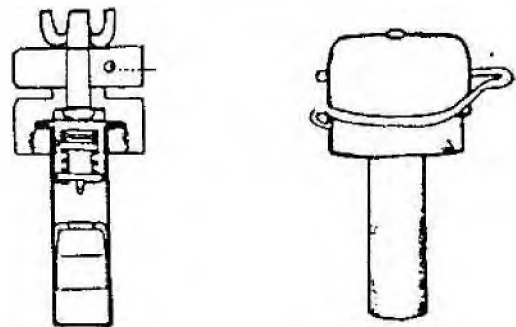
d. *Installing and Arming.*

- (1) Fasten the mine in place with spikes.
- (2) Place a Model 49 fuze; with detonator attached, in the well.
- (3) Remove safety clip from the fuze.

e. *Disarming.*

- (1) Search for and remove any boobytraps.
- (2) Follow the arming procedure in reverse order.

f. *Precaution.* Do not try to remove the detonator from the fuze, and be sure that the safety clip is held firmly in place.



PRESSURE FUZE

Figure 9-139. Mine, Antipersonnel M49 and M49B.

9-88. Mine, Antipersonnel M/48 Fragmentation (Sweden)

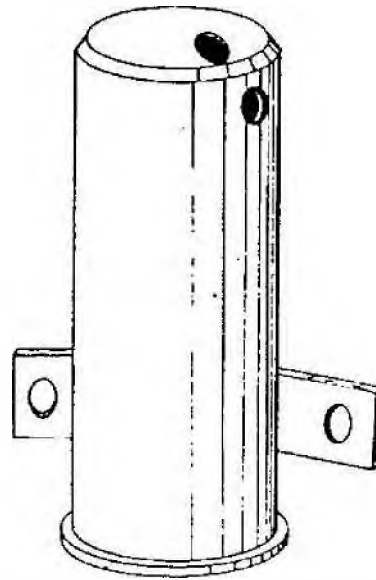


Figure 9-140. Mine, Antipersonnel M/48 Fragmentation.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.54" Height: 7.08"	6.39 lb	Pull	5.5 lb	TNT 0.5 lb	No data

a. *General.* This is a fragmentation type mine with an effective radius of 10-15 meters. The body is a cut-off 75mm shell charged with TN and scrap iron. The mine has a hole near the top and a metal strap near the bottom to aid in fixing the mine in place.

b. *Use.* The mine is used in wooded or grassy areas as a stake mine against foot troops.

c. *Functioning.* Removal of the striker-retain-

ing pin by force applied to the trip wire causes the fuze to function and fire the detonator. The booster and main charges are fired in turn and the shrapnel and case fragments are scattered horizontally through 360°.

d. *Installing and Arming.*

(1) Fasten the mine to a tree or stake, fuze well down.

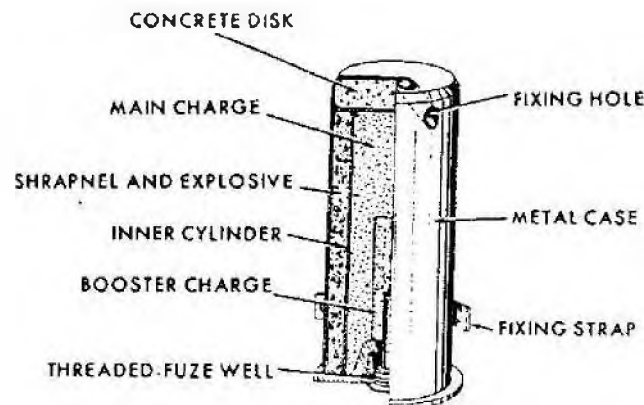


Figure 9-141. Mine, Antipersonnel M/48 Fragmentation.

(2) Prepare the pull fuze in accordance with the directions for the model of the fuze used.

(3) Insert the fuze in the mine.

(4) Attach an anchored tripwire to the striker-retaining pin.

(3) If the fuze has a safety pin, remove it.

c. Disarming.

(1) Search for and remove any boobytraps.

(2) Cut any slack tripwires.

(3) Disarm the fuze in accordance with directions for that type of fuze.

(4) Remove the fuze from the mine.

9-89. Mine, Antipersonnel M46 Warning Mine (Sweden)

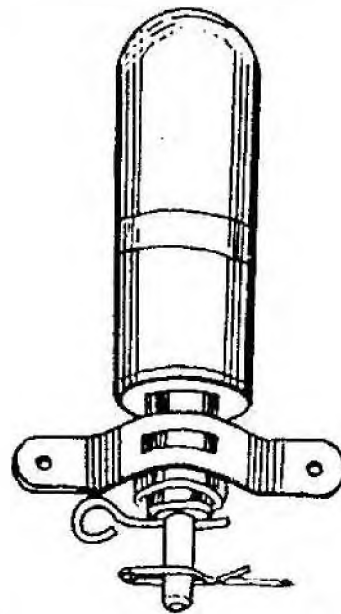


Figure 9-142. Mine, Antipersonnel M46 Warning Mine.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height: 4" approx.	1 75 oz	Pull	4.4—11 0 lb	No data	No booster

a. General. This mine has a cardboard case.

b. Use. The mine is attached to stake, post, or tree and rigged with a trip wire to give warning of the approach of enemy troops.

c. Functioning. A pull on the tripwire removes the striker retaining pin, permitting the striker to

hit and fire the percussion cap. The detonator and main charge are fired in turn.

d. Installing and Arming.

(1) Insert the fuze, with safety pin in place, in the mine.

(2) Attach the mine to a support, fuze end down.

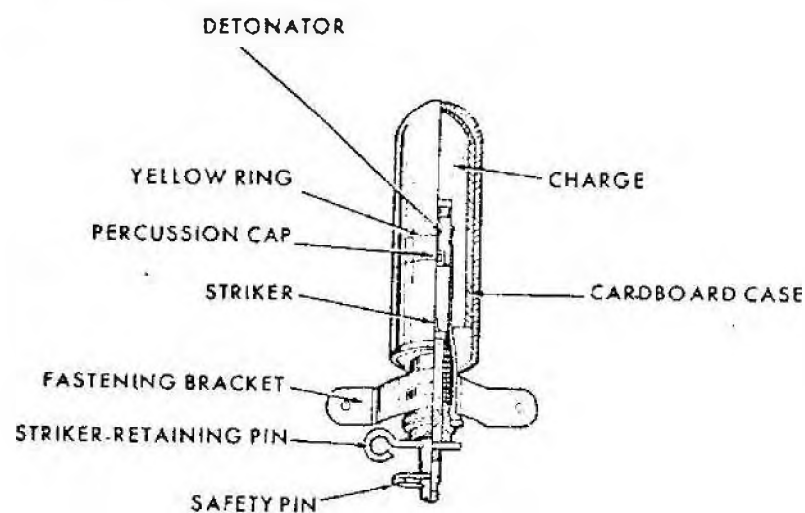


Figure 9-143. Mine, Antipersonnel M46 Warning Mine.

(3) Attach an anchored tripwire to the striker-retaining pin.

(4) Remove the safety pin.

e. Disarming. Follow the arming procedures in reverse order.

9-90. Mine, Antipersonnel Grenade Mine M43, 8cm (Sweden)



Figure 9-144. Mine, Antipersonnel Grenade Mine M43, 8cm.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.12"	5.3 lb	M43	4.4—11 lb	Nitrolit 0.8 lb	N/A
Height: 8.58"	5.5 lb	M43T			

General. This mine has an effective fragmentation radius of 10—12 meters.

9-91. Mine, Antipersonnel Grenade Mine M43T (Sweden)



Figure 9-145. Mine, Antipersonnel Grenade Mine M43T.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.8" Height: 15.6"	23.1 lb	No data	4.4—11 lb	No data	No data

General. This mine has an effective fragmentation radius of 10—20 meters.

9-92. Mine, Antipersonnel Grenade Mine, M43, 47mm (Sweden)



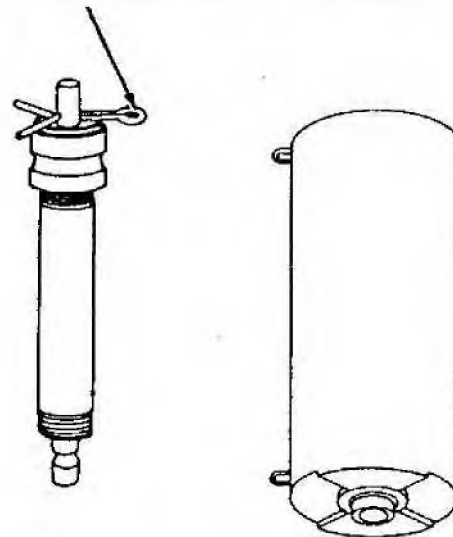
Figure 9-148. Mine, Antipersonnel Grenade Mine, M43, 47mm.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 1.88" Height: 7.6"	1.5 lb	Pressure and release.	4-11 lb	TNT 3.85 oz	No data

General. This mine has an effective radius of 4-6 meters. It is made from a 47mm mortar shell.

9-93. Mine, Antipersonnel, Concrete, Models 43 and 43(T) (Sweden)

COTTER TYPE SAFETY TRANSIT PIN



MODEL 42

Figure 9-147. Mine, Antipersonnel, Concrete, Models 43 and 43(T).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 4.16" Height: 9.02"	12.8 lb	Pull	2 lb or more	Nitrolit 1.3 lb	None

a. *General.* Model 43(T) has a trotyl instead of a nitrolit charge. The mine consists of an explosive-filled glass bottle in a concrete jacket. A 240° segment of the concrete jacket as steel shrapnel embedded in it, the other segment marked by a depression on the top of the mine has no shrapnel. Two metal loops embedded in the concrete near

the top and bottom of the mine are provided for fixing the mine in place. The mouth of the glass bottle is fitted with a hollow cork cylinder with a threaded nipple that accepts a pull fuze and detonator.

b. *Use.* The mine is used in wooded and grassy

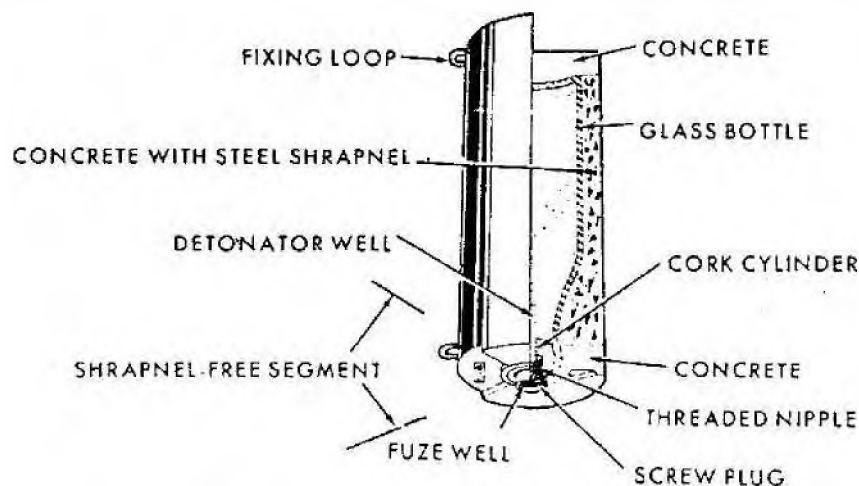


Figure 9-148. Mine, Antipersonnel, Concrete, Models 43 and 43(T).

areas as a stake mine against foot troops. The effective range is from 10 to 20 meters.

c. *Functioning.* Force applied to the tripwire withdraws the fuze striker-retaining pin. The spring-loaded striker fires the percussion cap, detonator, and main charge.

d. *Installing and Arming.*

(1) Remove the transit plug and secure the mine to a tree or stake, fuze well down.

(2) Prepare the pull fuze in accordance with the directions given for the particular model of fuze to be used.

(3) Screw the fuze into the mine.

(4) Attach an anchored tripwire to the striker-retaining pin.

(5) If the fuze has a safety, remove it.

e. *Disarming.*

(1) Search for and remove any antilift devices.

(2) Cut all slack tripwires.

(3) Disarm the fuze by the directions given for the model used.

(4) Remove the fuze from the mine.

9-94. Mine, Antipersonnel M/43T (Sweden)

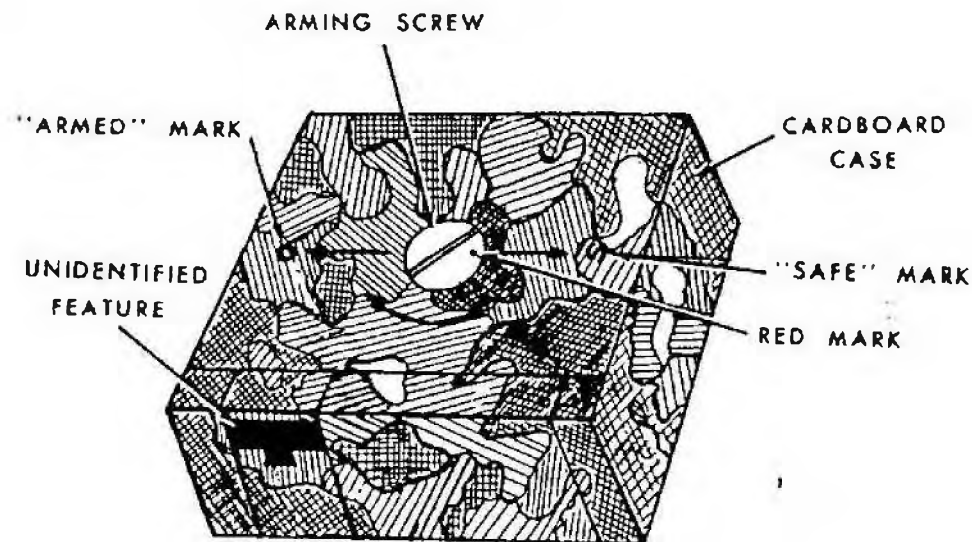


Figure 9-149. Mine, Antipersonnel M/43T.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 4.13" Width: 4.13" Height: 1.57"	0.5 lb	Pressure	No data	TNT 0.3 lb	

a. General. This is a standard Swedish mine. It consists of a rectangular cardboard case that contains a charge and an integral fuze system. On one edge of the mine is a detonator well closed by a rubber stopper.

b. Use. It is used in a conventional manner against foot troops.

c. Functioning. Pressure applied to either large face of the mine causes a supporting spring to move out of position and to allow a spring-loaded striker to fall and set off a percussion cap that, in turn, sets off the detonator and charge.

d. Installing and Arming.

- (1) Remove the detonator well plug.
- (2) Remove tape from safety screw and clean out its slot.

(3) Turn safety screw from "S", 180 degrees to "O."

(4) Place a detonator Model 43, open end first, into the detonator well.

(5) Replace the detonator well plug.

NOTE

During arming and disarming operations, hold the mine by its edges. Do not bring any pressure to bear on either large face.

e. Disarming.

- (1) Search for and remove any boobytraps.
- (2) Follow arming procedure in reverse order.

9-95. Mine, Antipersonnel M41 (Sweden)

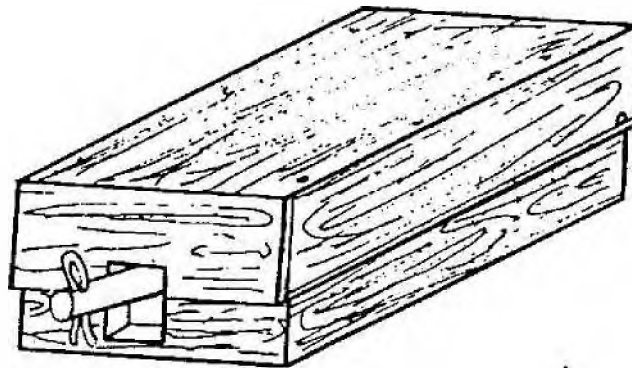


Figure 9-150. Mine, Antipersonnel M41.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Length: 7.87" Width: 3.14" Height: 1.96"	0.77 lb	Pressure pin withdrawal	4.4 lb	TNT 0.26 lb	None

a. *General.* This is a standard Swedish antipersonnel mine.

b. *Use.* The mine is used in a conventional manner against foot troops.

c. *Functioning.* Pressure on the lid of the mine forces it down, removing the striker-retaining pin

and actuating the fuze which fires the detonator and main charge.

d. *Installing and Arming.*

(1) Raise the lid and put the charge in place. (If the TNT block is used, it must be placed with the detonator well toward the unhinged end of the

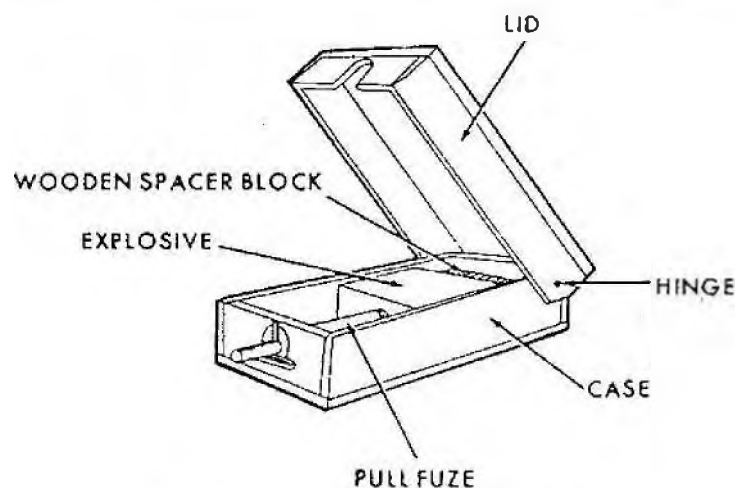


Figure 9-151. Mine, Antipersonnel M41.

box and held in the correct position by a small wooden spacer block placed between it and the hinged end of the box. If dynamite is used, it is merely pressed into the box.)

(2) Attach a detonator to the fuze.

(3) Place fuze in the mine. (If the TNT block is used, place the detonator in the well; if dynamite is used, the detonator is pressed into the explosive.)

(4) Lower the lid of the mine so it rests on

the wings of the striker-retaining pin which are beneath the striker.

(5) If the fuze has a safety pin, remove it.

e. Disarming.

(1) Search for and remove any boobytraps.

(2) Follow arming procedure in reverse order. Do not try to separate the detonator from the fuze, but tape the striker-retaining pin firmly in place.

9-96. Mine, Antipersonnel LI-11 (Sweden)

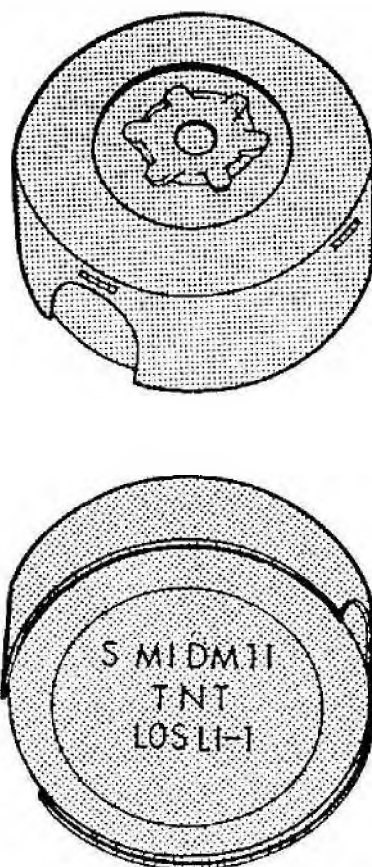


Figure 9-152. Mine, Antipersonnel LI-11.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.1" Height: 1.1"	7 oz	Integral pressure	11-22 lb (edge pressure)	TNT 4.3 oz	N/A

a. *General.* The antipersonnel mine LI-11 consists of a fixed bottom part and a movable upper part. The sections are made of plastic and are held together by a moisture-proof rubber casing. The mine has a safety container that allows it to be carried in the pocket.

b. *Functioning.* This is a blast type mine. The mine is detonated when subjected to pressure on its edge. An evenly distributed pressure, e.g., a

shock wave from a detonating mine clearing charge, will not detonate the mine.

c. *Installing and Arming.*

- (1) Place the safety ring on mine.
- (2) Unscrew transportation safety and insert the detonator.
- (3) Place the mine on the ground and then remove the safety ring.
- (4) Camouflage the mine if desired.

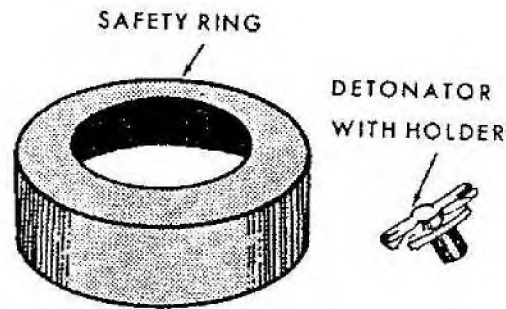
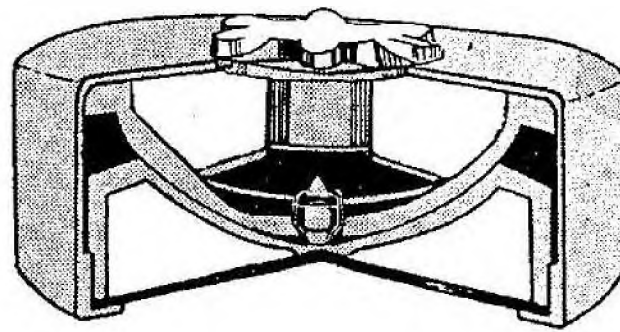
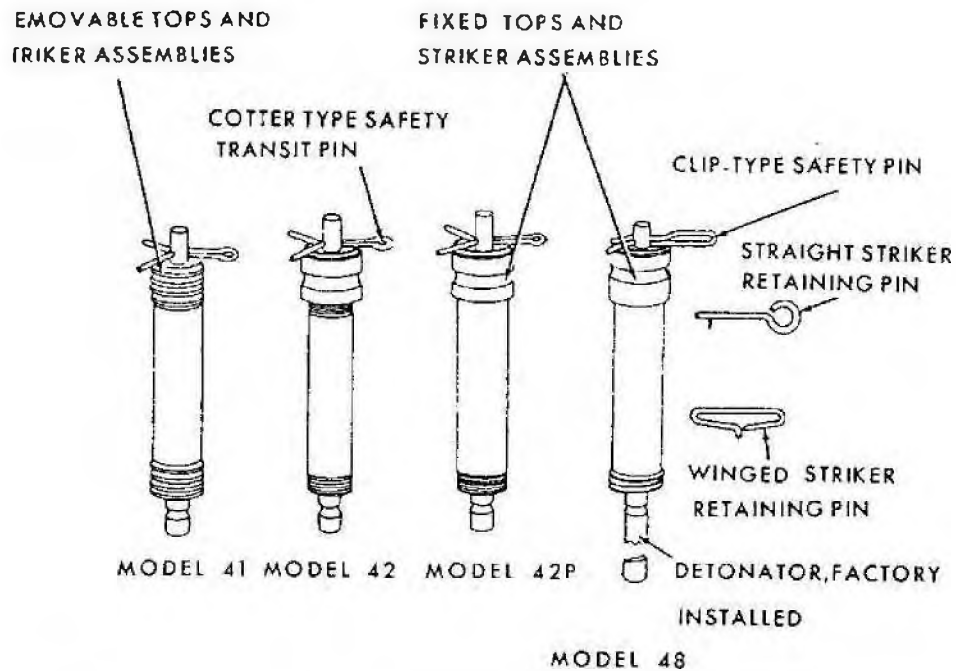


Figure 9-153. Mine, Antipersonnel LI-11.

9-97. Fuze, Pull, Models 41, 42, 42P and 48 (Sweden)



NOTE: ALL FUZES ARE SHOWN UNCOCKED, IN TRANSIT POSITION

Figure 9-154. Fuze, Pull, Models 41, 42, 42P and 48.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height: No data	41-sheet metal 42-iron 42P-zinc 48-zinc	Mechanical	4 4-11 lb. or more

a. General. These are pull fuzes with spring-loaded strikers, basically similar in type, but varying slightly in construction. All are provided with removable bases. Model 48 has a factory-installed detonator. Models 41 and 42 have removable tops and striker assemblies. Because of these variations in construction, arming and neutralizing methods differ.

b. Use. These fuzes are used to actuate Models 41, 42, 42P and 48 antipersonnel mines, also Model 48 fragmentation mine, Model 48 trip flare, Model 42 fuze adapter, and improvised mines and boobytraps.

c. Functioning. Applied force removes the striker retaining pin, and the striker, released and driven by its spring, hits and fires the percussion cap and detonator.

d. Installing and Arming.

(1) Models 41 and 42.

(a) Unscrew the top of the fuze and remove the striker assembly.

(b) Insure that a percussion cap is in place in the base.

(c) Compress the striker spring and put a striker retaining pin in the lower shaft hole.

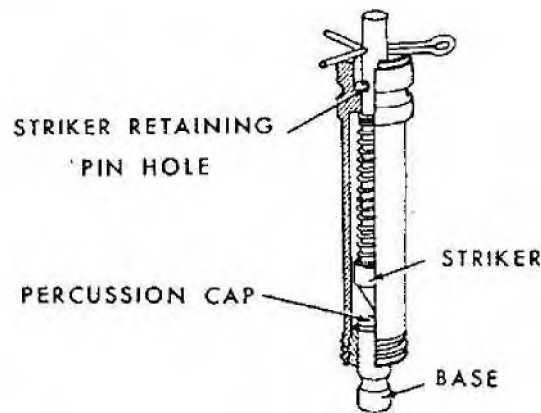


Figure 9-155. Fuze, Pull, Models 41, 42, 42P and 48.

(d) Replace the top and striker assembly in the case.

(e) Crimp a detonator to the base.

(f) Place the fuze in the mine or charge and arrange as necessary.

(g) Holding the striker retaining pin in place, remove the safety transit pin.

(2) Model 42P.

(a) Unscrew the base.

(b) Using a pencil or other suitable tool, compress the striker spring and insert a retaining pin in the shaft.

(c) Replace the base.

(d) Follow (e), (f), and (g) in (1), above.

(3) Model 48.

(a) Unscrew the base with the detonator attached.

(b) Follow (b) and (c) in (1), above.

(c) Replace the base.

(d) Follow (f) and (g) in (1), above.

e. Disarming.

(1) Models 41 and 42.

(a) Hold the striker retaining pin firmly in place.

(b) Unscrew and remove the case top and striker assembly of base and detonator, or both.

(2) Models 42P and 48.

(a) Hold the striker retaining pin firmly in place.

(b) Unscrew and remove the base and attached detonator. (Never attempt to separate the detonators from the fuze bases.)

9-98. Fuze, Bofors (antitank mines Mi 101, 102 and 103) (Sweden)

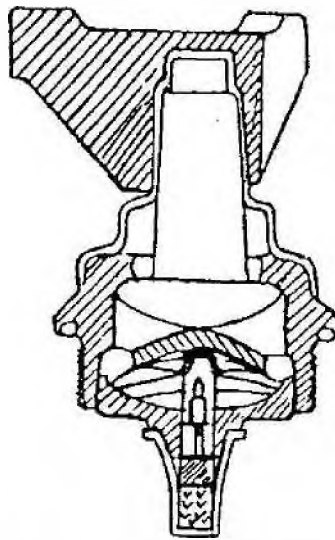


Figure 9-156. Fuze, Bofors (antitank mines Mi 101, 102 and 103).

Dimensions	Case	Internal action	Operating force
Diameter: No data Height: No data	Plastic	No data	Central load 617 lb. Load on one wing 308 lb.

a. General. This fuze is made chiefly of plastic and can thus not be located with an electrical mine detector. The mine fuze has no manually operated safety devices, which makes handling simple. The transport safety has a cover which is sheared off when the mine is run over. The fuze is supplied in an airtight container.

b. Use. The fuze is used in antitank mines Mi 101, 102, and 103.

c. Functioning. The releasing device is made with 3 wings with a very small tool pressure area. Accordingly, the fuze is not actuated by shock waves from the mine-clearing charges and also resists blast overpressure of long duration from tactical nuclear bombs.

Releasing device:

Radius of described circle

5cm

Pressure area

16 mc²

9-99. Mine, Antipersonnel, Concrete, Model 49 (Switzerland)

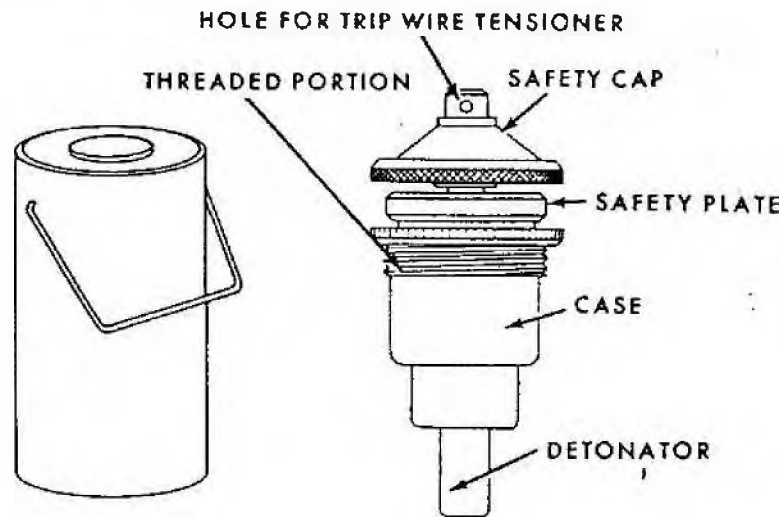


Figure 9-157. Mine, Antipersonnel, Concrete, Model 49.

Dimensions	Wt.	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 5.9" Height: 8.8"	19 lb approx.	Model ZDZ-49, combination: pull, tension- release, or pressure.	17.6 lb	1.1 lb TNT	N/A

a. *General.* This cylindrical mine has a concrete fragmentation jacket containing embedded steel shrapnel. The mine charge is in an axial internal cylinder with a fuze well on the top, closed by a cap during storage and transit. On the bottom of the mine, is a threaded well for a holder to fasten the mine to a stake. Accessories are spring tripwire tensioners, mine holder, fuze key, and spool of tripwire with a reel.

b. *Use.* This mine is designed for use against foot or airborne troops.

c. *Functioning.* Force on the tripwire, the release of a tension wire, or axial pressure or pull causes the functioning of the fuze and sets off the percussion cap.

d. *Installing and Arming.*

(1) Drive in stakes, one to support the mine and the other to serve as tripwire anchors (four stakes are needed to place the tripwires at 90° to each other, three stakes to set the tripwires at 120° to each other, or two stakes placed so that the tripwires form an angle of not less than 135°).

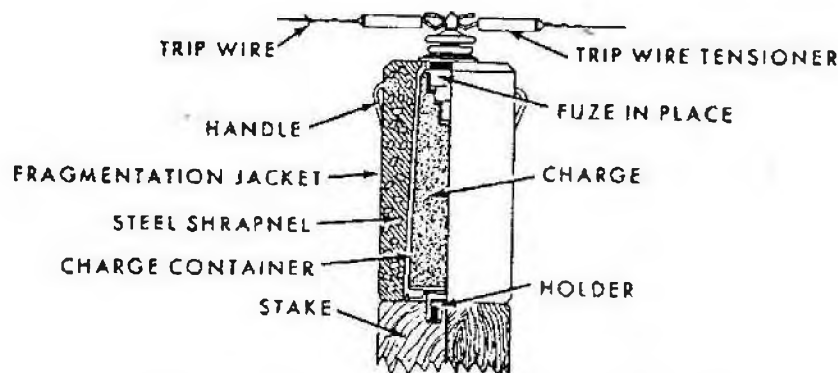


Figure 9-158. Mine, Antipersonnel, Concrete, Model 49.

(2) Drive a threaded mine holder into the stake top.

(3) Screw the mine to the holder.

(4) Attach a detonator assembly to the ZDZ.49 fuze.

(5) Turn the fuze safety cap a quarter of a turn and screw the fuze into the well by hand as far as it will go (do not use the fuze key).

(6) Attach the tripwires to the anchor stakes.

(7) Attach the required number of spring tensioners to the top of the fuze.

(8) Pass the free end of each tripwire through the eye of its spring tensioner and pull it taut until the end of the spring tensioner hook is even with the end of the case. Fasten each tripwire securely.

e. Disarming.

(1) Check for and remove any antilift devices.

(2) Carefully insert the safety plate. If it cannot be inserted easily, the mine must be destroyed in place.

(3) Turn the safety cap downward as far as it will go.

(4) Cut the tripwires.

(5) Remove the spring tensioners.

(6) Unscrew the fuze assembly from the mine body (using the fuze key, if necessary).

(7) Separate the detonator and the fuze.

(8) Remove the mine and fuze to a safe storage or disposal area.

(9) Unscrew the fuze safety cap upward as far as it will go.

(10) Remove the safety plate.

9-100. Mine, Antipersonnel, M3, Nonmetallic (Switzerland)

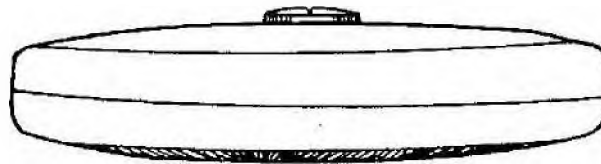


Figure 9-159. Mine, Antipersonnel, M3, Nonmetallic.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.1" Height: 0.7"	3.3 oz		33 lb	TNT 2.4 oz	No data

a. *General.* This mine has a plastic nylon body.

b. *Functioning.* When the required pressure is applied to the mine case, the striker is driven into the detonator and the mine explodes.

c. *Installing and Arming.*

(1) Remove the white safety screw in the bottom of the mine.

(2) Screw the red arming screw in the bottom of the mine (in place of the white safety screw). The arming screw contains the initiating element for the firing train.

(3) Bury the mine or place it on top of the ground, as desired.

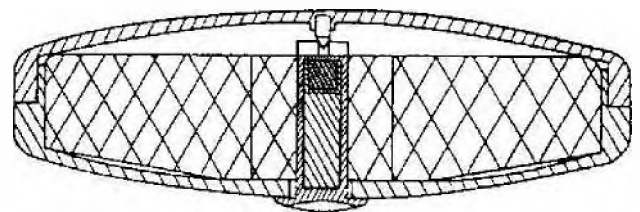


Figure 9-160. Mine, Antipersonnel, M3, Nonmetallic.

9-101. Mine, Antipersonnel, P59 (Switzerland)

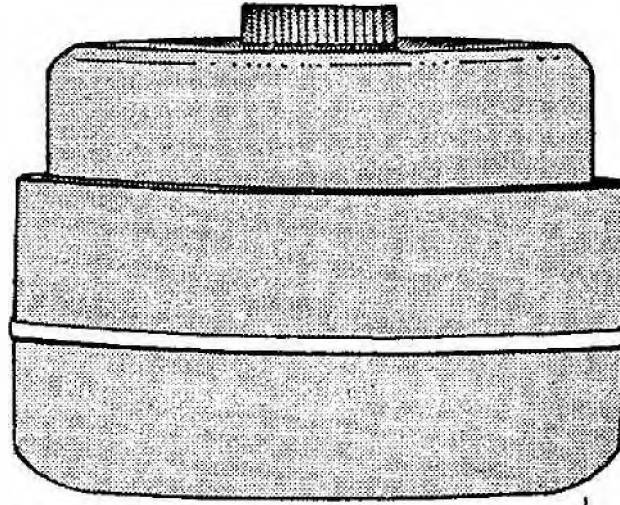


Figure 9-161. Mine, Antipersonnel, P59.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 2.8" Height: 2.1"	No data	None	11 lb	Pressed TNT 1.7—2.1 oz	No data

a. *General.* This blast type mine consists of a weatherproof cover, a plastic nylon body, a firing mechanism, and an explosive charge. A variable thickness glass plate is contained within the mine pressure plate and the striker and is used to adjust the amount of pressure required for mine initiation. The detonator screws into the bottom.

b. *Functioning.* When pressure is applied, the striker breaks the glass and strikes the detonator, initiating the mine.

c. *Installing and Arming.*

(1) Unscrew the white safety screw which locks the striker out of line with the detonator well.

(2) Remove the yellow cover and determine that the black bar is in safety position with the 2 red spots *separated* from each other.

(3) Replace the white screw by the red ignition screw.

(4) Turn the black bar to the right until the 2 red spots are side by side.

d. *Disarming.* Reverse the procedure used in Installing and Arming.

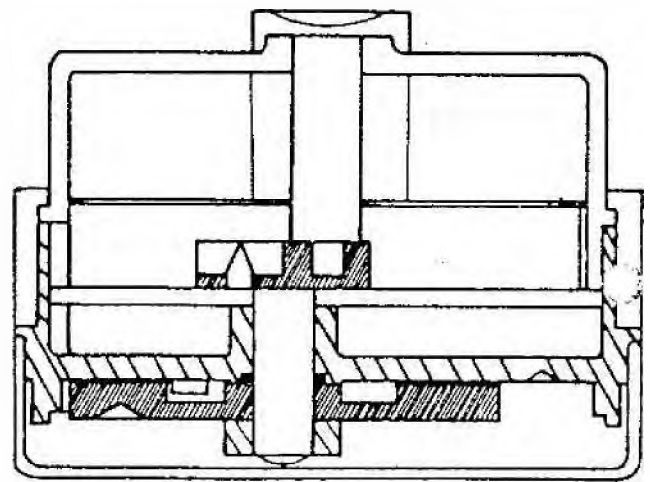


Figure 9-162. Mine, Antipersonnel, P59.

9-102. Fuze, Combination, ZDZ49 (Switzerland)

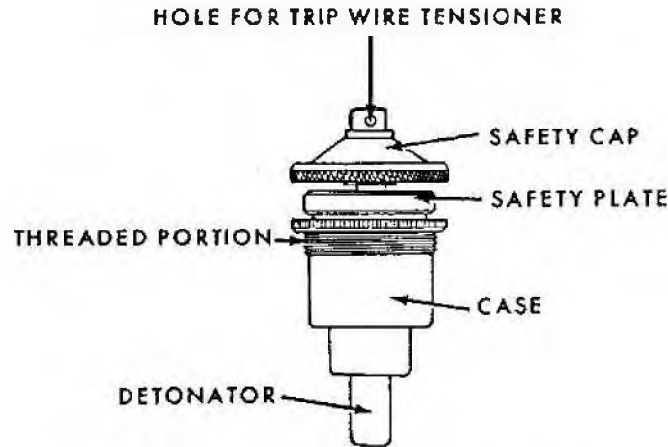


Figure 9-163. Fuze, Combination, ZDZ49.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height: No data	Metal	Mechanical	6 6 lb release of tension

a. General. This fuze, like a tiltrod fuze, can be actuated either laterally (pull or release of tension), or axially (pressure or pull). The lower part of the fuze holds the detonator and percussion cap. The upper part of the fuze has a safety cap which is screwed down the striker shaft to hold the safety plate in place.

b. Use. This fuze is used in Model 49 antipersonnel stake mines.

c. Functioning. The details of the inner part of the fuze are not known, but it is assumed that a spring-loaded striker is ball-retained and that movement of the head of the fuze results in a camming action that displaces the balls and frees the striker. The striker fires the percussion cap which sets off the detonator.

d. Installing and Arming.

- (1) Attach a detonator assembly to the fuze.
- (2) Unscrew the safety cap one quarter of a turn.

(3) Screw the fuze and detonator assembly into the mine.

(4) Attach required number of spring tensioners to the top of the mine.

(5) Pass the free end of each anchored tripwire through the eye of its spring tensioner and pull the wire taut until the end of the tensioner hook is even with the end of the case. Fasten each tripwire securely.

(6) Screw the safety cap upward as far as it will go.

(7) Remove the safety plate.

e. Disarming.

(1) Carefully insert safety plate and screw safety cap down tight.

(2) Cut tripwires and remove tensioners from top of fuze.

(3) Remove fuze assembly from mine.

(4) Separate detonator from fuze.

9-103. Fuze, Pressure, DKZ.b and DKZ.G (Switzerland)

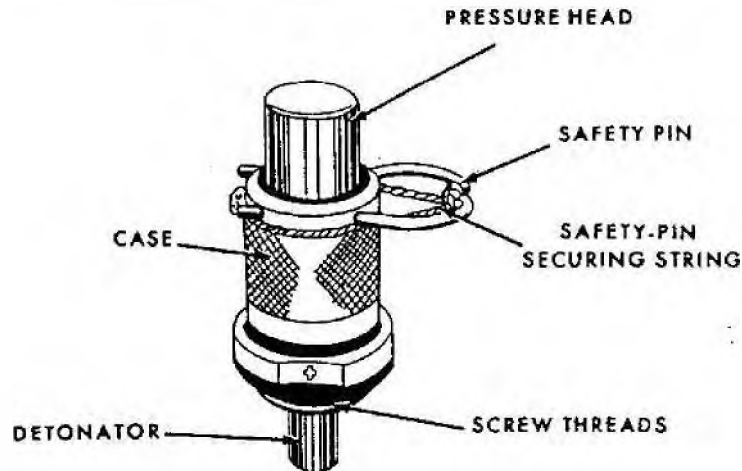


Figure 9-164. Fuze, Pressure, DKZ.b and DKZ.G.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	Metal	Mechanical	DKZ. b 24 lb DKZ.G 46 lb

a. *General.* Both fuzes are made of metal. The pressure head (upper section) extends into the case and houses the striker and striker spring. The DKZ.G has an additional threaded collar around the pressure head to accept an extension rod and this model requires more pressure to detonate than does the DKZ.b.

b. *Use.* These fuzes are used in the Model 37 light antitank mine. They may also be used in improvised mines and boobytraps.

c. *Functioning.* Required pressure forces the pressure head down, compresses the striker spring, and frees the striker-retaining balls. The released striker sets off the percussion cap to fire the detonator.

d. *Installing and Arming.*

(1) Screw a cap and detonator assembly into the base of the fuze.

(2) Place the fuze and detonator assembly in the mine.

(3) Attach a long cord to the safety pin.

(4) Remove the safety pin, with the long cord.

e. *Disarming.*

(1) Insert safety pin and secure it with string or tape.

(2) Unscrew the fuze and detonator assembly from the mine.

(3) Unscrew the detonator from the fuze.

9-104. Fuze, Pressure, DKZ, 42 (Switzerland)

Dimensions	Case	Internal action	Operating force
Diameter: No data Height: No data	Metal	Mechanical	33 lb or more

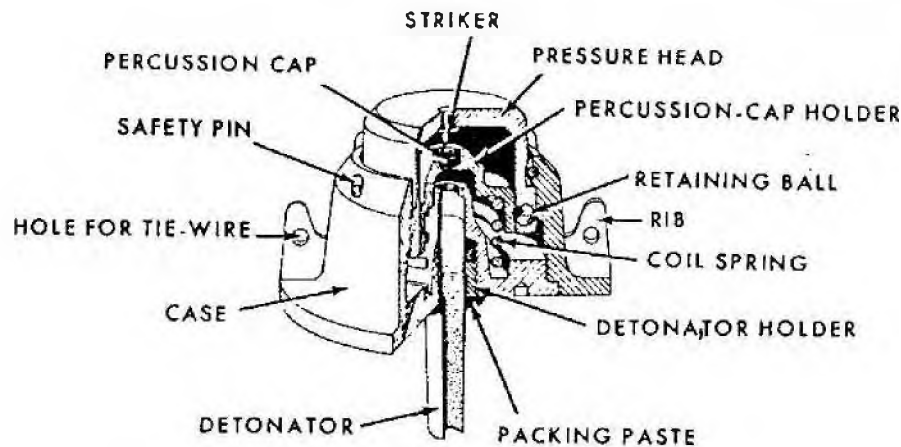


Figure 9-165. Fuze, Pressure, DKZ, 42.

a. *General.* The fuze has a squat cylindrical case with a flanged bottom and 4 external ribs. A pressure head with a fixed striker on the wider side of its top surface fits into the case. A percussion cap holder fits inside the lower part of the pressure head and is locked to it by retaining balls.

b. *Use.* This fuze is used in the Model 42 anti-tank mine.

c. *Functioning.* Pressure of 33 lb or more depresses the head of the fuze. The downward movement compresses the coil spring and allows the retaining balls to escape and release the percussion cap holder. The percussion cap is driven against the fixed striker point and fired. The detonator is fired by the percussion cap.

d. *Installing and Arming.*

(1) With the fuze key, back off the detonator holder a few turns.

(2) With the pointed end of the key, enlarge the opening of the detonator holder slightly.

(3) Insert the open end of the detonator (blasting cap No. 8) into the holder.

(4) Fit the hollow end of the fuze key over the detonator and screw in the holder until it grasps the detonator. Do *NOT* screw the holder too tightly since it may deform the detonator and cause it to explode.

(5) Apply packing paste around the detonator where it emerges from the base of the fuze.

(6) Place the fuze in the mine and secure it with the wires provided.

(7) Attach a long cord to the safety pin.

(8) Cut the string holding the safety pin to the fuze, and remove the safety pin with the long cord.

e. *Disarming.*

(1) Insert the safety pin and fasten it with a string to the fuze.

(2) Remove the fuze from the mine.

(3) With the fuze key, loosen the holder and remove the detonator.

9-105. Fuze, Pressure, DKZ-49 (Switzerland)

Dimensions	Case	Internal action	Operating force
Diameter: No data Height: No data	Metal	Mechanical	385 lb or more

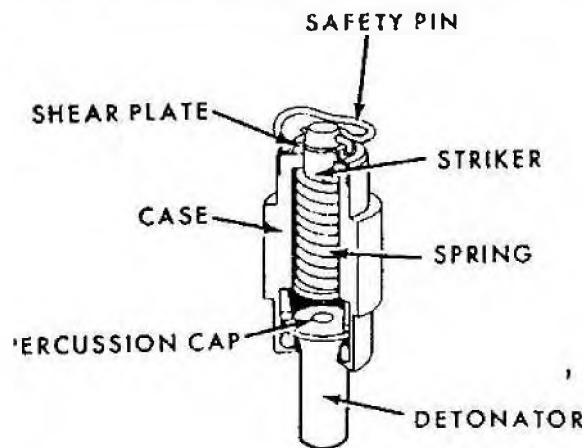


Figure 9-166. Fuze, Pressure, DKZ-49.

a. General. The fuze consists of a cylindrical metal case, a shear plate, and a spring-loaded striker. A percussion cap and detonator assembly are permanently attached to the fuze. A butterfly-type safety pin passes through and clips around the striker.

b. Use. This fuze is used in the Model 49 light antitank mine.

c. Functioning. Pressure of about 385 pounds or more cuts the shear plate, releasing the spring-

loaded striker against the percussion cap which, in turn, fires the detonator.

d. Installing and Arming.

- (1) Install fuze and attached detonator assembly in the fuze well of the mine.
- (2) Remove the safety pin.

e. Disarming.

- (1) Reverse of arming procedure.
- (2) DO NOT attempt to remove the detonator from the fuze.

9-106. Fuze, Pull, M43 (Switzerland)

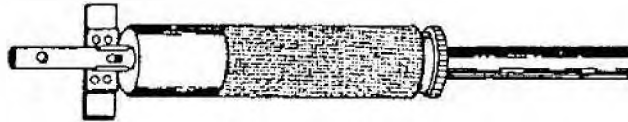


Figure 9-167. Fuze, Pull, M43.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	Metal	Mechanical	8.8 lb or more

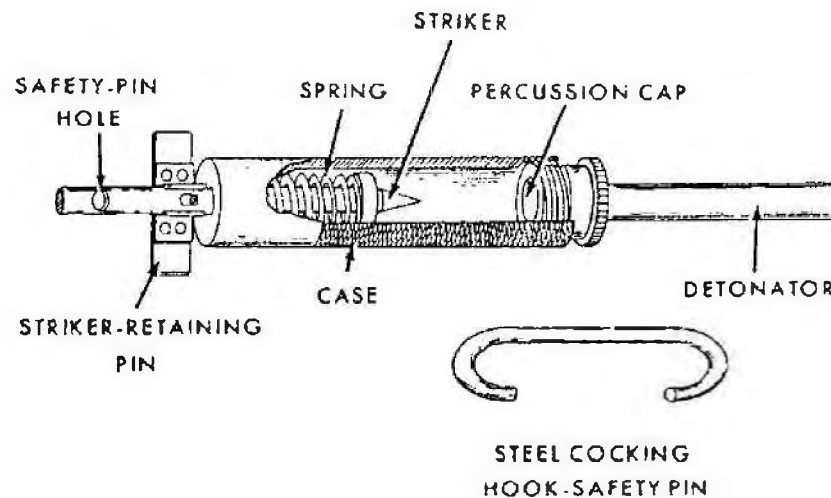
END VIEW STRIKER.
RETAINING PIN

Figure 9-168. Fuze, Pull, M43.

a. *General.* The fuze consists of a cylindrical metal case containing a spring-loaded striker. An internally threaded section at the bottom accommodates a detonator and percussion cap assembly.

b. *Use.* This fuze is used in the Model 43 anti-personnel mine.

c. *Functioning.* Pressure of 8.8 lb or more on the lid of the fuze forces the T-shaped retaining pin out of the striker shaft and releases the spring-loaded striker against the percussion cap which, in turn, fires the detonator.

d. *Installing and Arming.*

(1) With the steel hook, pull the striker shaft until the T-shaped striker retaining pin can be inserted.

(2) Screw the percussion cap and detonator assembly to threaded bottom of the fuze.

(3) Insert the fuze and detonator assembly in the mine.

(4) Remove the steel hook from the striker shaft.

e. *Disarming.* Reverse the arming procedure.

9-107. Mine, Antitank, 4 Skg, Metallic (Turkey)

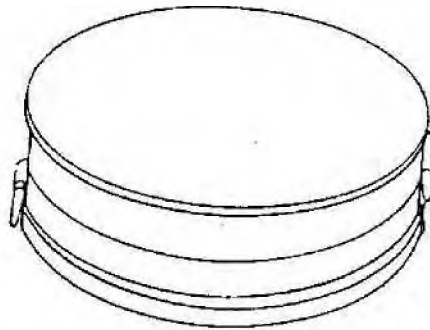


Figure 9-169. Mine, Antitank, 4 Skg, Metallic.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 10" Height: 3'	14.3 lb approx.	Pressure	165 lb approx.	Cast TNT 9.9 lb	TNT and tetryl. No data on weight.

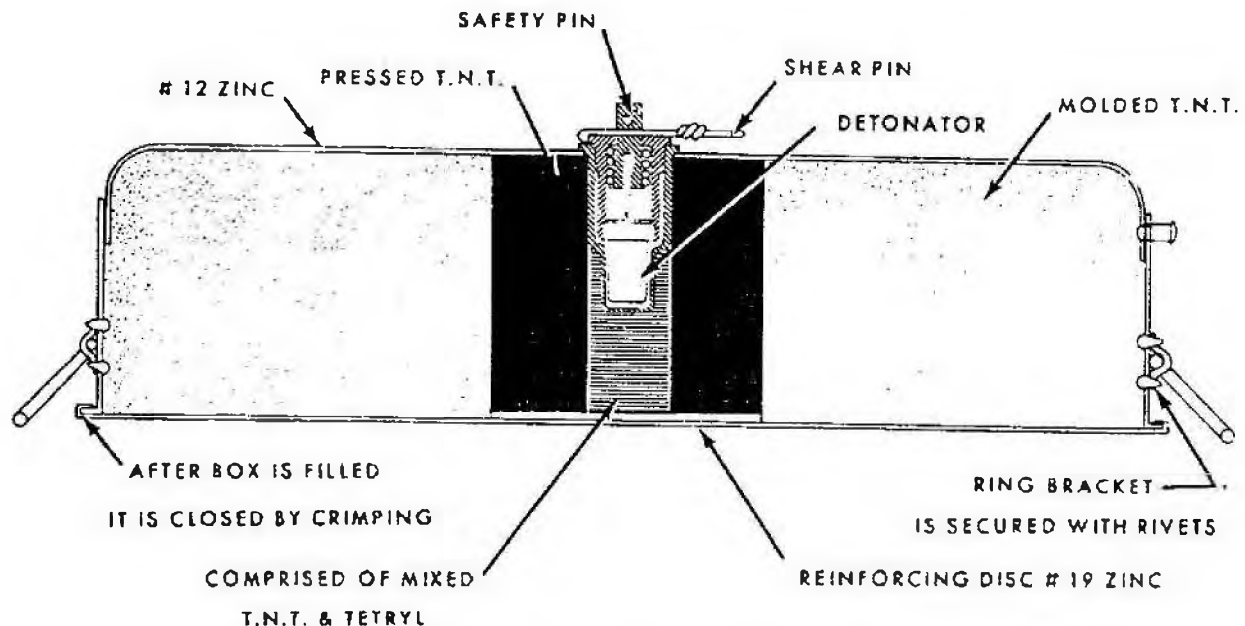


Figure 9-170. Mine, Antitank, 4 Skg, Metallic.

a. General. The mine case is made of sheet steel. The mine has a friction-fit pressure plate which encloses a shear-type pressure fuze. The mine contains a main charge of 4.5 KG (9.9 lb) of cast TNT. There is also a smaller model of this mine which has a 4.4 lb cast TNT main charge.

b. Use. The mine is used in a conventional manner against wheeled and tracked vehicles.

c. Functioning. The required pressure forces the pressure plate onto the fuze. The shear wire

of the fuze fails and allows the spring-loaded striker to fall. The firing chain is carried from the percussion cap through the detonator and booster to the main charge.

d. Installing and Arming.

- (1) Remove the pressure plate.
- (2) Insert the fuze, with detonator attached, into the well.
- (3) Remove the safety pins from the fuze.

(4) Replace the pressure plate.

(5) Booby trap the mine, if desired.

e. Disarming.

(1) Inspect for and remove any booby trapping devices.

(2) Follow the arming procedure in reverse order.

9-108. Fuze, Pressure (Turkey)

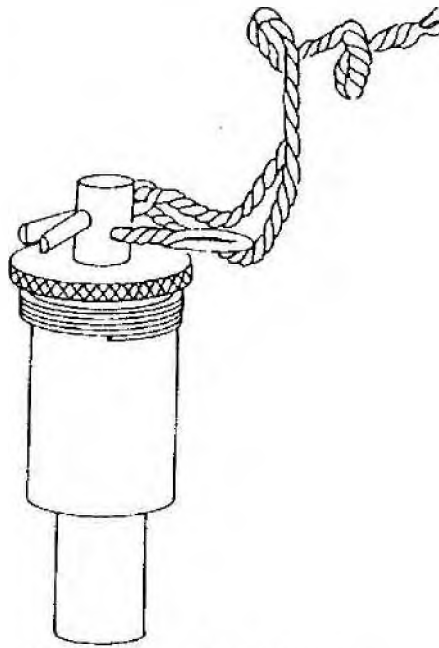


Figure 9-171. Fuze, Pressure.

Dimensions	Case	Internal action	Operating force
Diameter: 0.39" Height: (case only) 0.97"	Brass	Mechanical	165 lb (varied pins)

a. General. This is a mechanical model with a striker retained by a shear pin. The actuation force may be varied by the use of different sized shear pins. The standard one fails under a force of about 165 lb. The brass case has an outer shell screwed together. The inner shell contains the striker spring and is threaded at the lower end to receive the detonator.

b. Use. This fuze is used with the 9.9 lb anti-tank mine.

c. Functioning. Required pressure causes the spring-driven striker to shear the shear pin and strike the detonator, thus initiating the explosion.

d. Installing and Arming.

- (1) Screw the fuze into the mine.
- (2) Remove the safety pin.

e. Disarming.

- (1) Inspect the mine and remove any antilift devices.

- (2) Insert a safety pin in the fuze.
- (3) Unscrew the fuze from the mine.

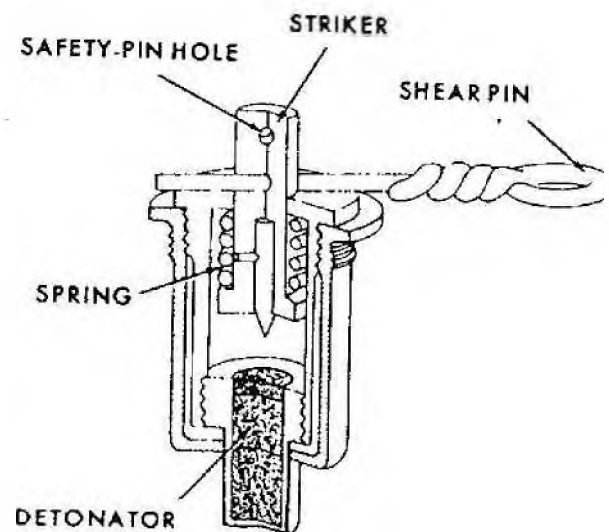


Figure 9-172. Fuze, Pressure.

9-109. Mine, Antitank, Mark 5 H. C. (Heavy Charge) (United Kingdom)

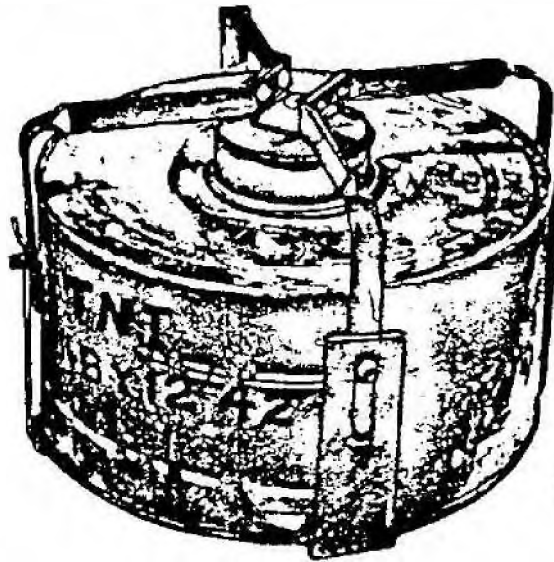


Figure 9-173. Mine, Antitank, Mark 5 H. C. (Heavy Charge).

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 8" Height: 4.0" w/o spider	12.5 lb approx.	Pressure	350-400 lb.	TNT 8.3 lb approx.	CE and TNT (Integral)

a. General. The mine has a steel case fitted with a pressure spider (Mark 1 or 2) which is held in place by four slotted metal straps secured to the bottom of the case. The fuze well is located at the top center of the case and is covered with a metal cap. Another version of the mine, the Mark 5 G.S. has the same dimensions as the H.C. but contains

only 4.5 lb. of explosive and has a total weight of 8.8 lb.

b. Use. This mine is effective against most medium tanks, but may not cut the track of heavy tanks unless laid double. It is employed in large tactical minefields, road blocks, and unit security.

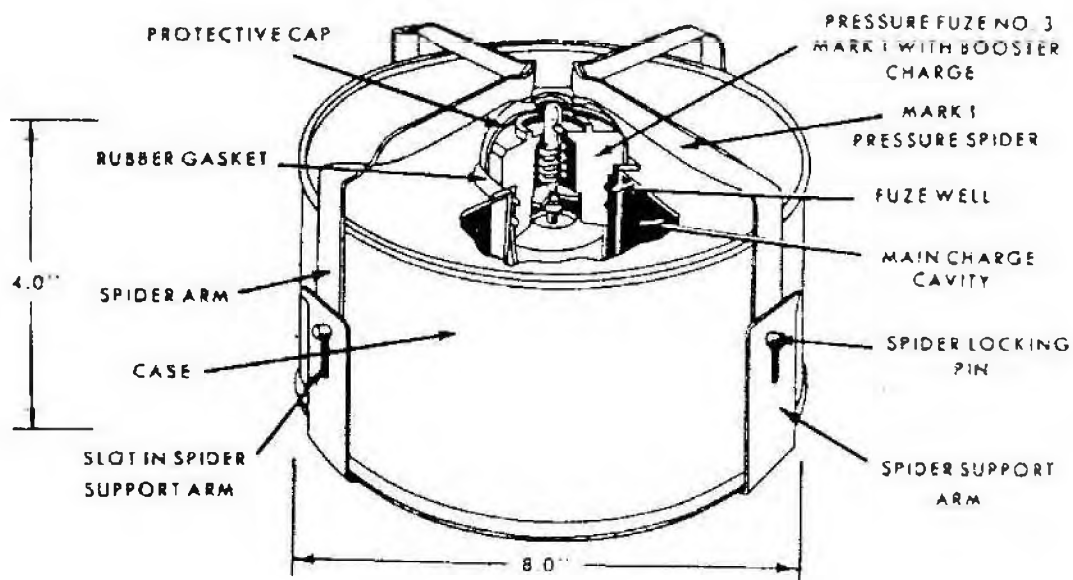


Figure 9-174. Mine, Antitank, Mark 5 H. C. (Heavy Charge).

c. *Functioning.* Pressure on the spider crushes the protective cap over the fuze and severs the shear pin, releasing the spring-loaded striker against the percussion cap and firing the mine.

d. *Installing and Arming.*

(1) Remove the pressure spider and protective cap.

(2) Remove the paper sealing the fuze well.

(3) Inspect the fuze (No. 3, Mark 1) to see that the shear pin has not been damaged.

(4) Withdraw the safety pin from the fuze.

(5) Insert the fuze into the fuze well of the mine.

(6) Replace the protective cap so it rests on the rubber washer.

(7) Replace the pressure spider, making certain that the locking pins engage the slots of the spider.

e. *Disarming.*

(1) Remove any boobytrapping devices

(2) Remove the pressure spider and protective cap, being careful not to exert pressure on the fuze.

(3) Insert the safety pin in the fuze.

(4) Remove the fuze from the mine.

9-110. Mine, Antitank, Mark 7 (United Kingdom)

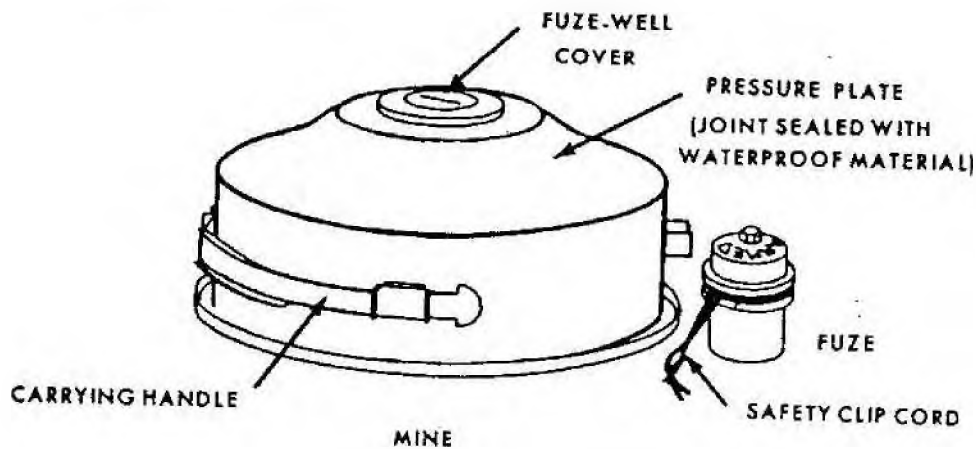


Figure 9-175. Mine, Antitank, Mark 7.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12.8" Height: 5.1"	30 lb.	Pressure	600 lb approx.	TNT 19.6 lb. approx.	Tetryl 3 oz

a. *General.* This is similar to the German Telermine type. The mine is actuated through a waterproof pressure plate and uses a pressure-mechanical fuze which fits into a centrally located fuze well. Another well is located in the bottom of the case for boobytrapping devices. The mine was designed to replace the antitank mine, Mark 5.

b. *Use.* This mine is capable of stopping heavy tanks by cutting the tracks.

c. *Functioning.* Pressure of approximately 600 lb on the pressure plate forces it down, transmitting pressure to the fuze. The striker, which is held by a Belleville spring, is forced down until the spring reverses, driving the striker against the detonator, which fires the charge.

d. *Installing and Arming.*

(1) Unscrew the fuze-well cover in the pressure plate and remove the fuze.

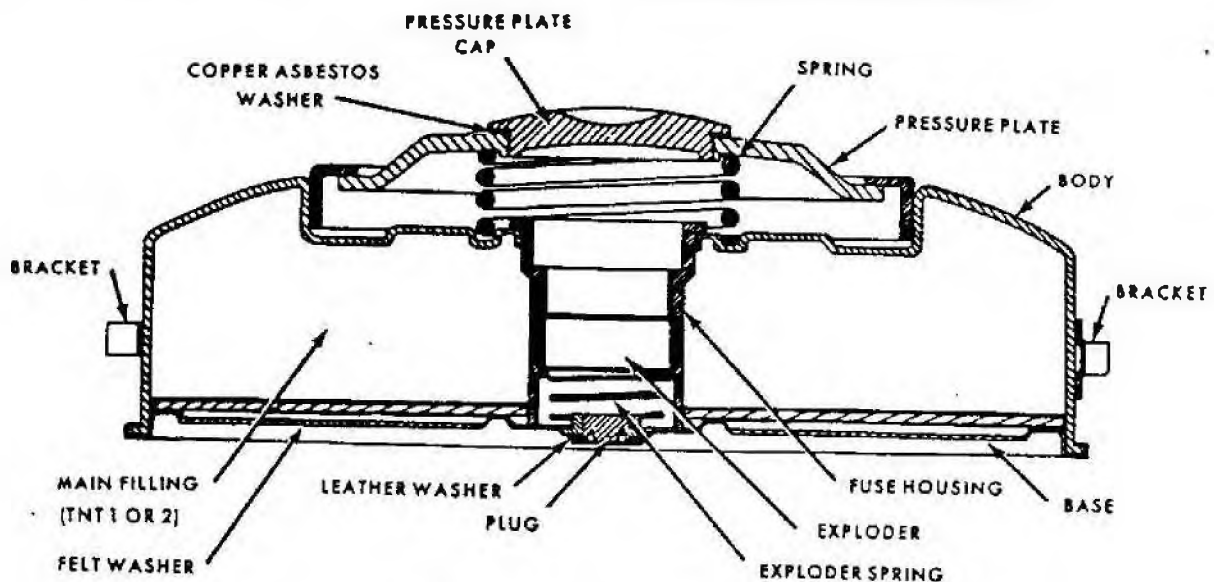


Figure 9-176. Mine, Antitank, Mark 7.

- (2) Remove the fuze safety clip.
- (3) Replace the fuze in the mine with the end marked "Armed" uppermost.
- (4) Screw down the fuze-well cover.
- (5) Install a boobytrapping device, if desired, using the well provided in the bottom plate of the mine.

e. Disarming.

- (1) Locate and remove any boobytrapping devices.
- (2) Unscrew the fuze-well cover and remove the fuze.
- (3) Replace the safety clip on the fuze.
- (4) Replace the fuze in the mine with the end marked "Unarmed" uppermost.
- (5) Replace the fuze-well cover in the pressure plate.

9-111. Mine, Antitank, Mark 1 (United Kingdom)

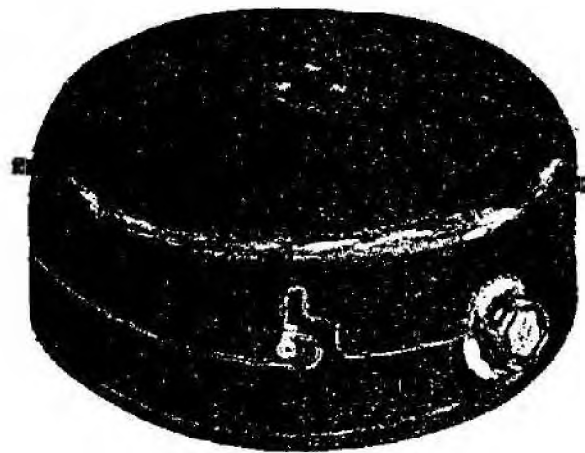


Figure 9-177. Mine, Antitank, Mark 1.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 7.5" Height: 2.8"	Approx. 7 lb	Pressure	350 lb approx.	4 lb Baratol	No data

a. *General.* The mine has a pressure plate and central fuze well with detonator and booster charge.

b. *Use.* The mine is used in road blocks, mine-fields, etc.

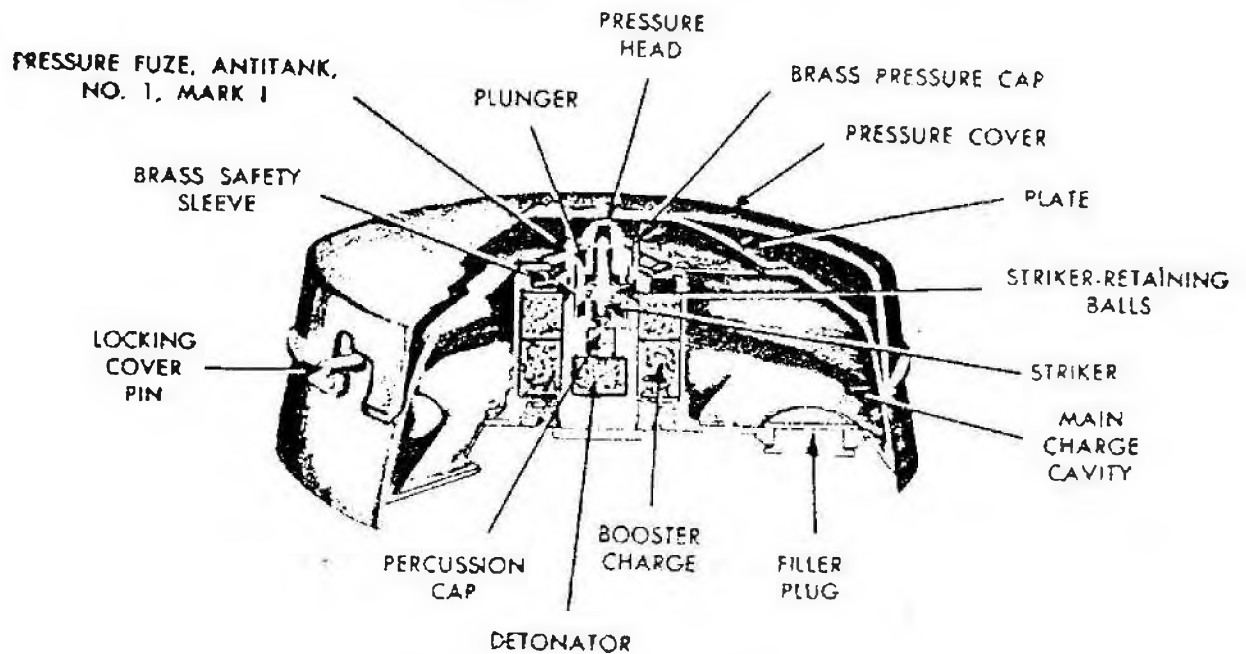


Figure 9-178. Mine, Antitank, Mark 1.

9-112. Mine, Antipersonnel "Doris" Nonmetallic (United Kingdom)

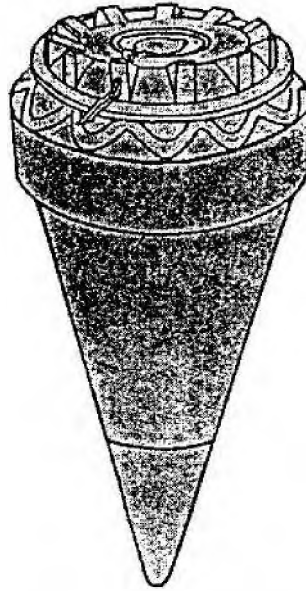


Figure 9-179. Mine, Antipersonnel "Doris" Nonmetallic.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3" Height: 4"	6 oz	Internal pressure	15-30 lb	Shaped tetryl 0.5 oz	Lzy 2.3 grains

a. General. This blast type mine has a plastic case and resembles the US M-25 antipersonnel mine. It has a shaped charge, ball and sleeve firing mechanism and a pointed body shape for rapid emplacement. The "Doris" unlike the US M-25 is emplaced as a complete unit, then armed. The mine is not detectable with magnetic mine detectors, but a removable aluminum detector ring is fitted so that the mine can be laid in a detectable condition. The mine is waterproof.

b. Functioning. The "Doris" is pressure-operated and contains an integral detonator and explosive charge. The mine body contains the ball and sleeve fuze and a detonator in a pivoted housing. Arming action brings the detonator into line with the striker and stemmed channel, unlocks the fuze mechanism and frees the charge mechanism to move vertically.

c. Installing and Arming.

- (1) Push the mine into the ground (with the

hand or foot) up to the underside of the flange and the top of the body.

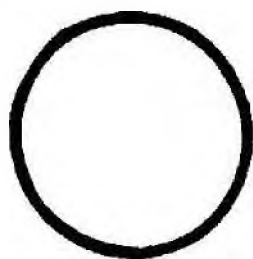
- (2) Remove the split pin and rotate the charge housing clockwise through 120°. When the charge housing reaches the *armed* position, it becomes locked (and the mine is armed).

d. Disarming.

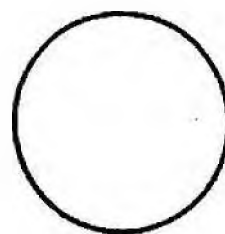
- (1) In the unarmed condition, the detonator is out-of-line with the striker and the fuze mechanism is locked so that it cannot actuate should the mine be dropped.

- (2) If the detonator is initiated in the *safe* position, it will not detonate the main charge.

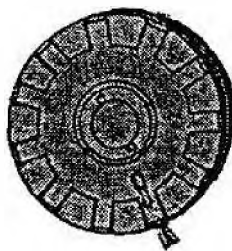
f. Precautions. The "Doris" mine has the safety and arming marking underneath the pressure plate, however, it cannot be seen when the mine is buried. Thus, the *armed* state of the mine cannot be determined usually and as a result arming is somewhat difficult.



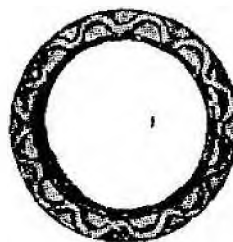
SEALING RING



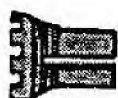
O-RING



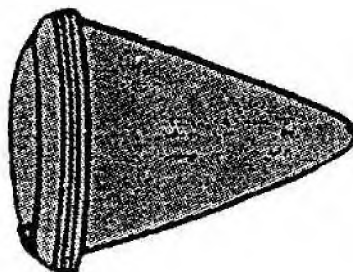
CAP



RETAINING AND
ARMING RING



BALL AND
SLEEVE HOUSING



MINE BODY



FIRING PIN
HOUSING

Figure 9-180. Mine, Antipersonnel "Doris" Nonmetallic.

9-113. Mine, Antipersonnel, Mark 2, Bounding (United Kingdom)

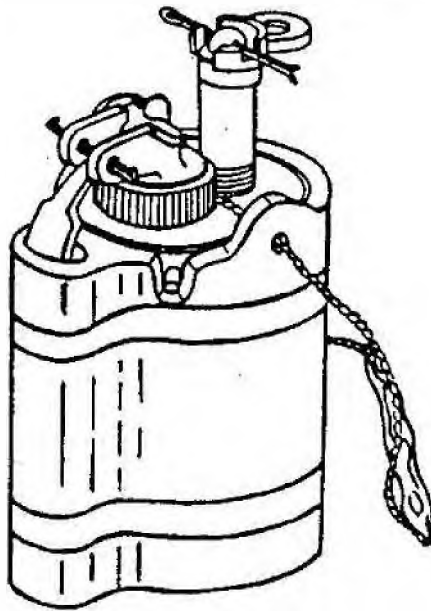


Figure 9-181. Mine, Antipersonnel, Mark 2, Bounding.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.5" Height: 5.6" 7.9" including fuze	10 lb	Mechanical (2)	4 lb pull	Amatol 1 lb	None; propellant charge is blank cartridge.

a. General. This is a bounding fragmentation mine consisting of a cast iron case, containing a steel-cased cylindrical projectile fastened to the bottom of the case by two screws. The mine has two mechanical fuzes, one for firing the propelling charge and one for the main charge. Although the effective casualty radius is 9 to 14 meters, it is dangerous to personnel at distances up to 46 meters.

b. Use. This mine is laid in antipersonnel minefields for security and in antitank minefields to hinder reconnaissance and breaching parties.

c. Functioning. Force applied to the tripwire of the propelling fuze pull-plate pulls out the plate releasing the spring-driven striker against the blank cartridge. The pressure from the blank cartridge explosion breaks the screws holding the projectile to the case and propels it into the air. The lever retaining the striker of the main charge fuze clears the well on the side of the case and springs outward, which releases the spring-actuated striker against the detonator assembly and

fires the main charge at about 1 meter above the ground.

d. Installing and Arming.

(1) Unscrew the propelling charge fuze with a wrench.

(2) Insert the blank cartridge in the fuze well and replace the fuze.

(3) Unscrew the main charge fuze.

(4) Insert the detonator assembly with the percussion cap uppermost and replace the fuze with its striker retaining lever extended downward into its well.

(5) Place the mine in the hole so that the pull plate of the propelling charge fuze is just above ground level.

(6) Attach the tripwire to an anchor and to the pull plate.

(7) Remove the safety pins from both fuzes.

e. Disarming.

(1) Check for and remove any antilift devices.

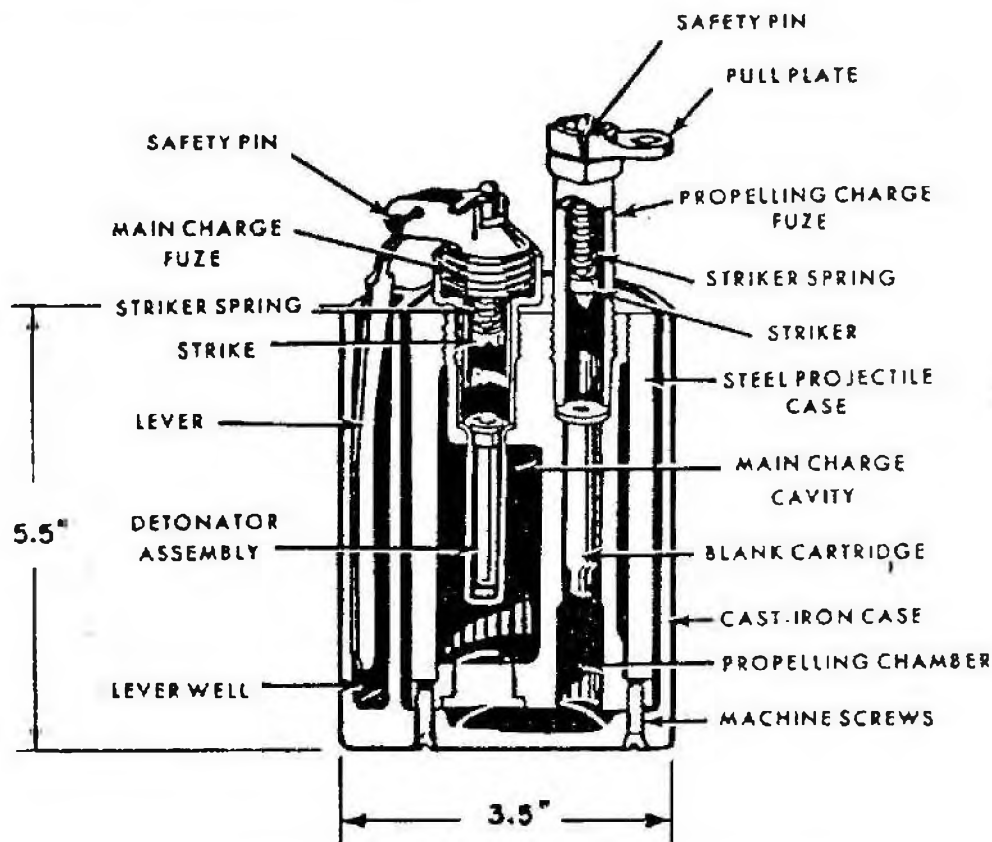


Figure 9-182. Mine, Antipersonnel, Mark 2, Bounding.

- (2) Insert a safety pin or nail in the safety-pin hole of each fuze.
- (3) Trace and cut the tripwire:

- (4) Unscrew the propelling charge fuze and remove the blank cartridge.
- (5) Unscrew the main charge fuze and remove the detonator assembly.

9-114. Mine, Antipersonnel, "Ointment Box" (United Kingdom)

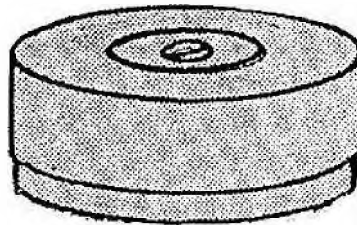


Figure 9-183. Mine, Antipersonnel, "Ointment Box."

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: No data Height:	8 oz	Pressure	30 lb	TNT 3 Oz	None (2 detonators act as booster)

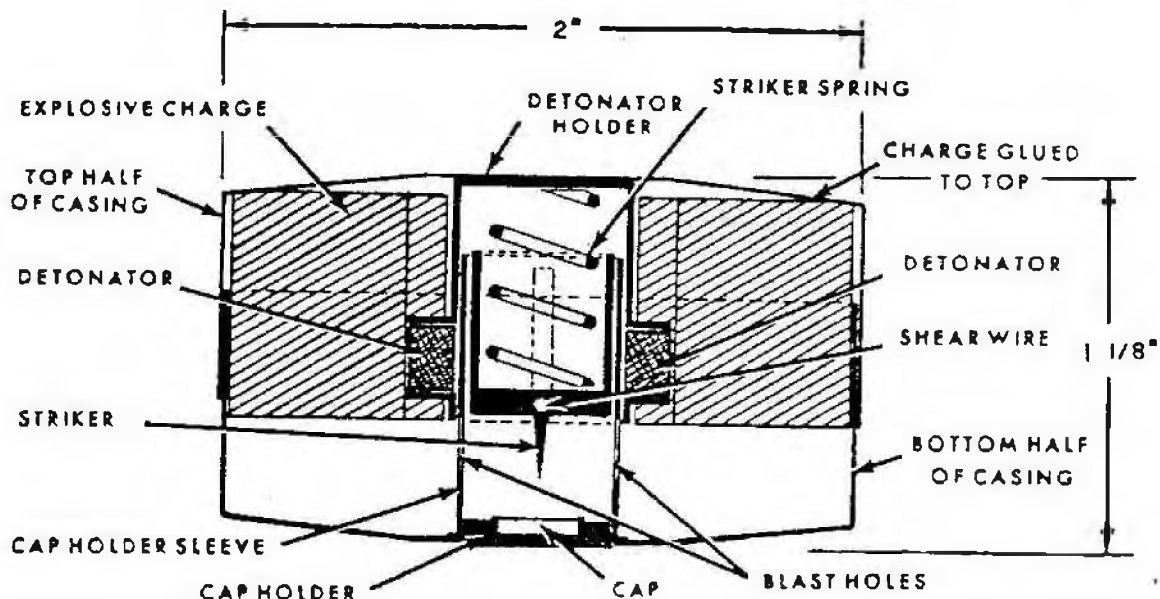


Figure 9-184. Mine, Antipersonnel, "Ointment Box."

a. *General.* The mine is made of sheet steel and is round in shape like an ointment box. It is often camouflaged to simulate a clog of earth, dung, or lump of coal.

b. *Use.* The mine is employed around unit positions, in ditches, and along roads and trails for its nuisance value. The mine is effective against only the man who steps on it or it may burst a vehicle tire running over it.

c. *Functioning.* Pressure of 30 lb on upper half of case shears a shear wire releasing the striker. The striker driven by the striker spring fires the percussion cap, detonator, and main charge.

d. *Installing and Arming.*

(1) Inspect the shear wire in the upper half of the mine to see that the striker is cocked and secure.

(2) Fit the detonator holder over the fuze housing.

(3) Insert the upper half of the mine into the lower half.

(4) Screw in the percussion cap.

e. *Disarming.*

(1) Separate the lower half of the mine from the upper half.

(2) Unscrew the percussion cap from the upper half of the mine.

9-115. Fuze, Pressure, No. 3, Mark 1 (United Kingdom)

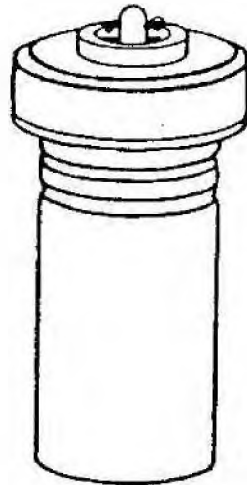


Figure 9-185. Fuze, Pressure, No. 3, Mark 1.

Dimensions	Case	Internal action	Operating force
Diameter: 7.0" approx. Height: 3.5" approx.	Steel	Mechanical	400—500 lb

a. General. This pressure fuze is of the instantaneous type with a spring-loaded striker, a cotter pin type safety pin that extends through the striker shaft just above the shear pin, and a detonator and a booster charge crimped to the base.

b. Use. This fuze is used with antitank mines Mark 4 and Mark 5.

c. Functioning. The shear pin shears at the application of pressure on the striker shaft. This

releases the striker against the percussion cap, firing the detonator and then the booster charge.

d. Installing and Arming.

- (1) Emplace the mine.
- (2) Insert the fuze in the mine and withdraw the safety pin.

e. Disarming.

- (1) Insert a safety pin in the safety-pin hole. (This fuze is dangerous to handle because of the

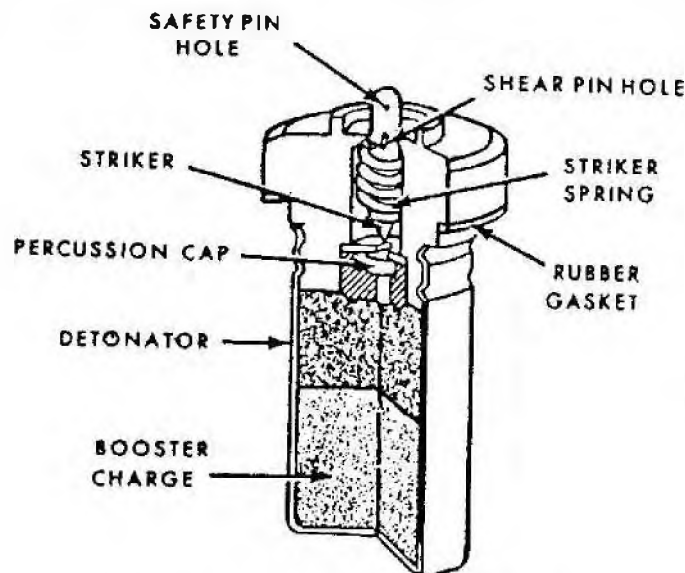


Figure 9-186. Fuze, Pressure, No. 3, Mark 1.

built-in detonator and booster charge. Handlers must be careful, even when the safety pin is in place.)

(2) Unscrew the fuze from the mine.

(3) Destroy this fuze after removing it from the mine.

9-116. Fuze, Pressure-Release, No. 3, Mark 1 (United Kingdom)

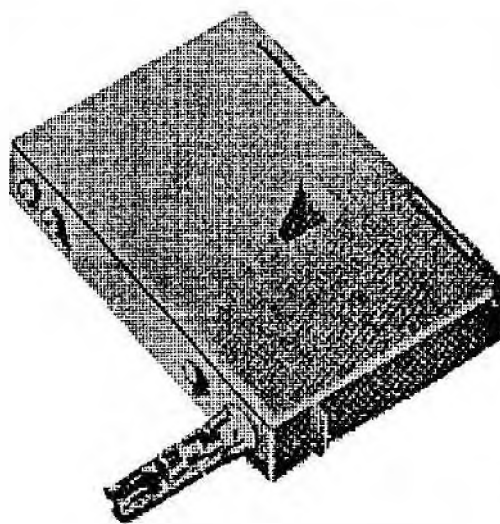


Figure 9-187. Fuze, Pressure-Release, No. 3, Mark 1.

Dimensions	Case	Internal action	Operating force
Length: 3.0" Width: 2.0" Height: 0.5"	Metal	Mechanical	5 lb (pressure required to keep mine from functioning.)

a. *General.* The No. 3 Mark 1 pressure-release fuze has an outer metal case and a striker attached to the end of a leaf spring and held in cocked position by a safety pin. When armed, the striker is held by an inclined tongue in the hinged lid that acts as a stop for the leaf spring. A fuze adapter or a detonator adapter with a percussion cap is screwed into the side of the fuze.

b. *Use.* This mine fuze is also used in charges

placed under crates, packages, and similar objects as boobytrap devices.

c. *Functioning.* The removal of weight off the hinged lid permits the leaf spring to force the lid upward and release the striker. The striker then hits and fires the percussion cap.

d. *Installing and Arming.*

(1) Bend the leaf spring back until the hole

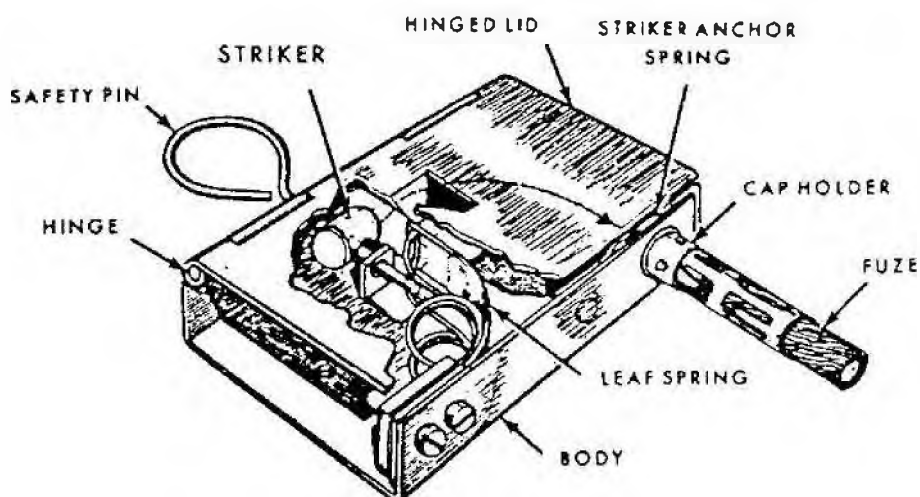


Figure 9-188. Fuze, Pressure-Release, No. 3, Mark 1.

through the striker is in line with the hole in the fuze case and insert the safety pin.

(2) Screw the fuze adapter or detonator adapter into the fuze case.

(3) Set the fuze in position and connect it to the charge.

(4) Place the object to be boobytrapped on top of the fuze. (It must weigh at least 5 lb.)

(5) Withdraw the safety pin. (With sufficient weight on the lid, the pin should come out easily.)

e. Disarming.

(1) Insert a safety pin in the fuze and disconnect the fuze from the charge.

(2) Remove the boobytrapped object from the top of the fuze.

(3) Remove the fuze adapter or detonator adapter from the fuze.

(4) Take the fuze and charge to a safe storage or disposal area.

f. Precautions. If the safety pin cannot be replaced and the fuze and charge are connected by a time fuze, cut the time fuze and then remove the boobytrapped object. Otherwise, if the safety pin cannot be replaced destroy the fuze and charge in place.

9-117. Fuze, Pull, No. 4, Mark 1 (United Kingdom)



Figure 9-189. Fuze, Pull, No. 4, Mark 1.

Dimensions	Case	Internal action	Operating force
Diameter: 0.4" Length: 3.8"	Brass	Instantaneous, mechanical	6-8 lb

a. General. This is an instantaneous mechanical fuze. It has a spring-loaded striker with a retaining-clip release. The striker is held in place by a U-shaped, claw-ended retaining clip with claws gripping the ball-shaped end of the striker shaft. A bracket with holes for attaching the fuze to an object is brazed to the case. A standard adapting assembly with a percussion cap to accept a non-electric blasting cap or time fuze screwed into the base. The safety pin extends through the top of the fuze case and the ball-shaped end of the striker shaft.

b. Use. This fuze is especially adaptable for boobytrapping doors, windows, and objects that appeal as souvenirs. It is also used in mines, demolition charges, and light flares.

c. Functioning. A pull of 6-8 lb on the trip wire pulls the retaining clip off the ball-shaped end of the striker shaft, releasing the spring-driven striker which is driven against the percussion cap.

d. Installing and Arming.

- (1) Unscrew the adapter from the base.
- (2) Secure the fuze to the object to be booby-trapped.
- (3) Attach a tripwire to the U-shaped retaining clip and adjust the tension of the wire until the safety pin lies about half way along the slots in the fuze case.
- (4) Insert a nonelectric blasting cap in the adapter assembly. (For delay, insert a length of time fuze in the adapter instead of a nonelectrical blasting cap.)

(5) Screw the adapter into the base of the fuze.

(6) Remove the safety pin.

e. Disarming.

- (1) Insert a safety pin into the safety pin hole in the ball-shaped end of the striker shaft.
- (2) Cut any slack tripwires. (Taut wires must be checked first.)
- (3) Unscrew the adapter from the base of the fuze.

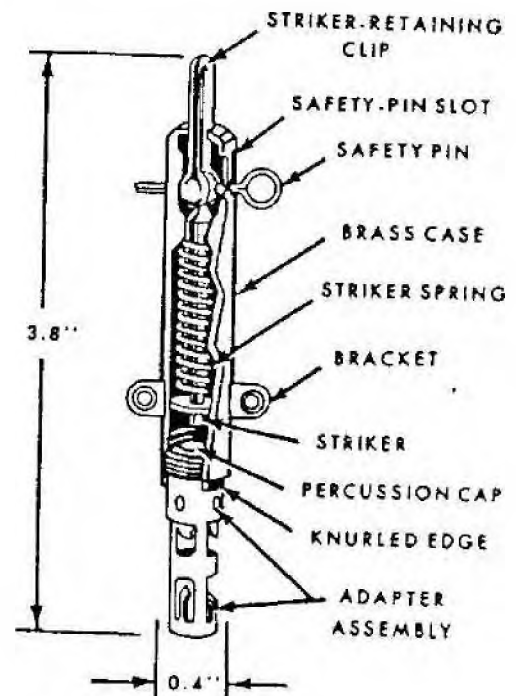


Figure 9-190. Fuze, Pull No. 4, Mark 1.

9-118. Fuze, Pressure, No. 5, Mark 1 (United Kingdom)

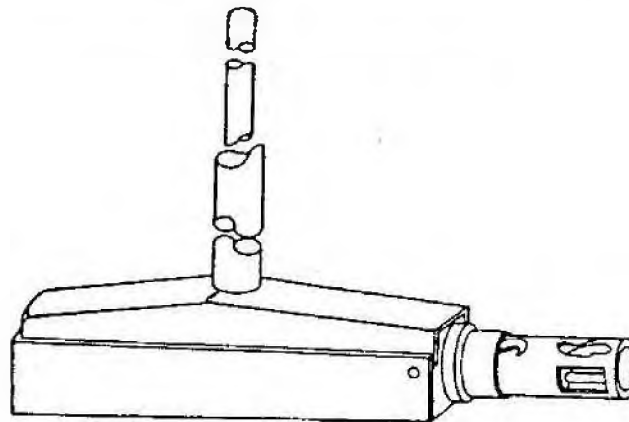


Figure 9-191. Fuze, Pressure, No. 5, Mark 1.

Dimensions	Case	Internal action	Operating force
Length w/adaptor: 3.8" Width: 1.8" Height w/o extension rod: 0.8"	Sheet metal	Mechanical	21--60 lb or 40--55 lb applied to extension rod.

a. General. This is the instantaneous mechanical type fuze consisting of a sheet metal case that contains a spring-loaded striker with a trip lever release. The free or upper end of the trip lever is supported by two coil springs which hold the bottom in a notch in the under side of the striker shaft. The pressure lever, which is hinged at one end to the lower part of the case, rests on the projection of the trip lever. A brass sleeve may be screwed into the center of the pressure lid to take an adjustable extension pressure rod. A standard adapter assembly containing a percussion cap—to

receive a nonelectric blasting cap or time fuze—is screwed into the base of the fuze. A safety pin is inserted through the fuze case and the striker shaft.

b. Use. This fuze is adaptable to use in improvised mines and boobytraps in buildings under floorboards, staircases, and furniture and in roads or paths under stones and debris. The adjustable extension pressure rod makes it usable with charges under railroad tracks.

c. Functioning. A force of about 21 pounds on

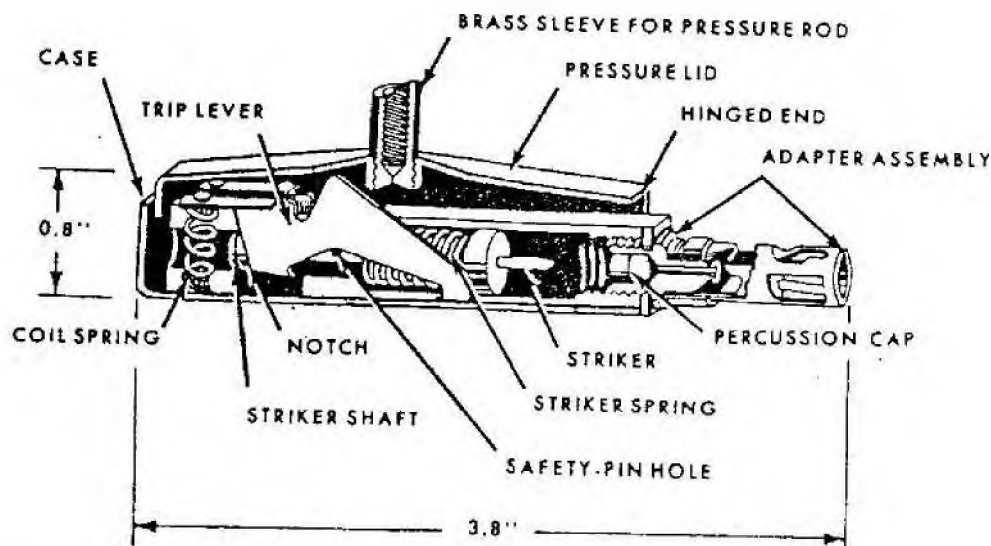


Figure 9-192. Fuze, Pressure, No. 5, Mark 1.

the free end of the pressure lid, 60 pounds at the center, or 40 to 55 pounds applied to the extension rod depresses the trip lever until it clears the notch in the striker shaft, releasing the striker to fire the percussion cap.

d. Installing and Arming. When used in booby-traps without the pressure rod:

(1) *Preliminary test.*

(a) Unscrew the adapter and install the fuze in close contact with the object that will conceal and operate the fuze.

(b) Remove the safety pin to determine that the striker will not be released by the object alone but by the weight of a man stepping on it.

(2) *Activating.*

(a) Reset the striker and insert the safety pin ((f) below).

(b) Screw the adapter assembly into the threaded end of the fuze.

(c) Insert a nonelectric blasting cap in the adapter assembly. (For delay, insert a length of time fuze in the adapter instead of the nonelectric blasting cap.)

(d) Connect the fuze to a demolition charge.

(e) Place the fuze and demolition charge in the same position as in the preliminary test.

(f) Remove the safety pin. This should withdraw easily; but if it resists, replace the fuze or check the setup.

e. Disarming.

(1) Insert a safety pin in the safety-pin hole through the striker shaft and out through the other side of the case.

(2) Cut or remove the time fuze, detonating cord, or cap that connects the fuze to the charge.

9-119. Fuze, Pressure-Release, No. 6, Mark 1 (United Kingdom)

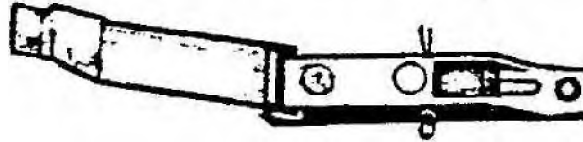


Figure 9-193. Fuze, Pressure-Release, No. 6, Mark 1.

Dimensions	Case	Internal action	Operating force
Length w/adapter: 4.5" Width: 0.6" Height: 0.6"	Metal	Mechanical	7 lb (required to keep fuze from functioning)

a. *General.* This is mechanical instantaneous type fuze containing a spring activated striker with a trip lever release. It is provided with a narrow rectangular metal case with a lid hinged at one end and resting on a hinged trip lever. This lever retains the striker by engaging in a notch in the top of the striker shaft. A cotter pin is used as the safety. A standard adapter with percussion cap is screwed into the base.

b. *Use.* The No. 6, Mark 1 is used in boobytraps placed in narrow openings, such as under a door, behind a drawer, or under heavy objects, such as packing cases, that are likely to be lifted. It may also be installed in mines as a boobytrap.

c. *Functioning.* At the removal of the weight from the hinged lid, the pressure of the compressed striker pivots the trip lever about its hinge pin, lifting the lid until the trip-lever clears the notch in the striker shaft and releases the striker against the percussion cap.

d. *Installing and Arming.*

(1) Screw the adapter assembly into the threaded end of the fuze.

(2) Insert a nonelectric blasting cap in the adapter assembly (for delay, insert a length of time fuze in the adapter instead of the nonelectric blasting cap).

(3) Connect the fuze to a demolition charge.

(4) Place the fuze and demolition charge under the mine or object to be boobytrapped so that the hinged lid is held down tightly.

(5) Remove the safety pin, which pulls out easily when the object on the lid weighs 7 pounds or more.

e. *Disarming.*

(1) Insert a safety pin or nail in the safety pin hole.

(2) Remove the fuze from the demolition charge.

(3) Unscrew the adapter assembly.

(4) Remove the blasting cap.

(5) Take the fuze to a safe storage or disposal area.

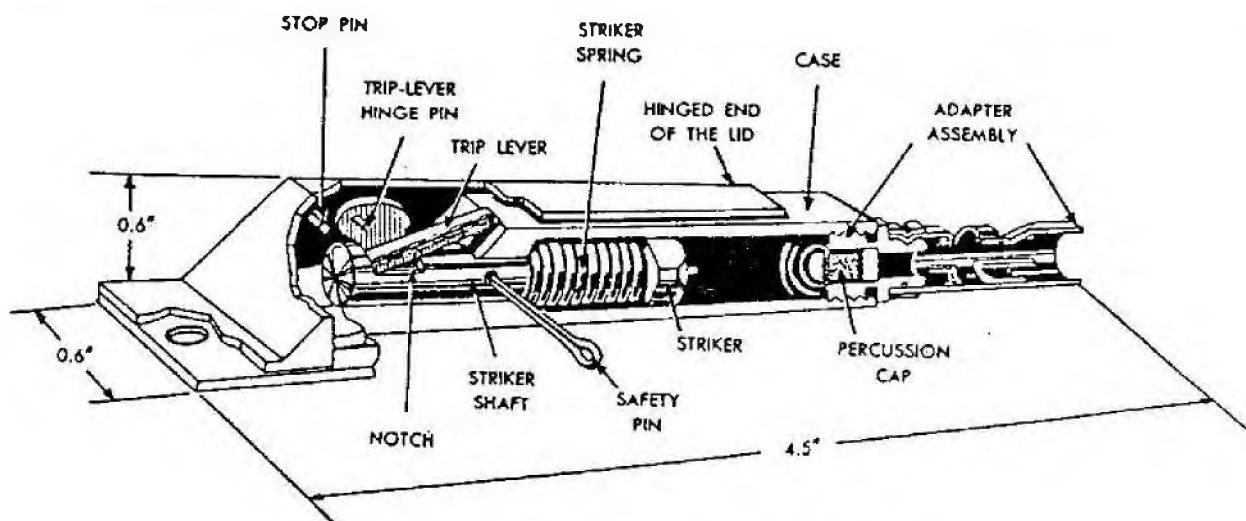


Figure 9-194. Fuze, Pressure-Release, No. 6, Mark 1.

9-120. Fuze, Pressure-Release, No. 12, Mark 1 (United Kingdom)

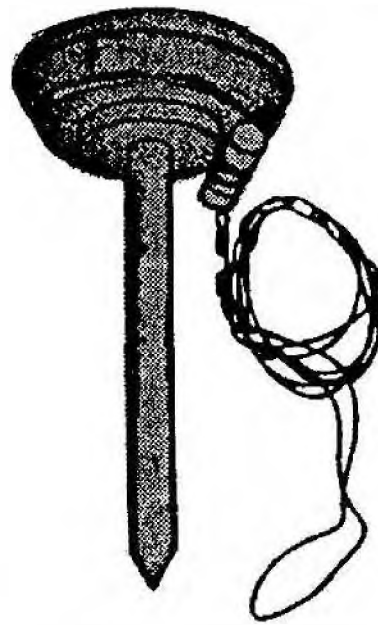


Figure 9-195. Fuze, Pressure-Release, No. 12, Mark 1.

Dimensions	Case	Internal action	Operating force
Diameter (tube): 0.4" Length (tube): 5.0"	Metal	Mechanical	2.5 lb (to keep fuze from functioning)

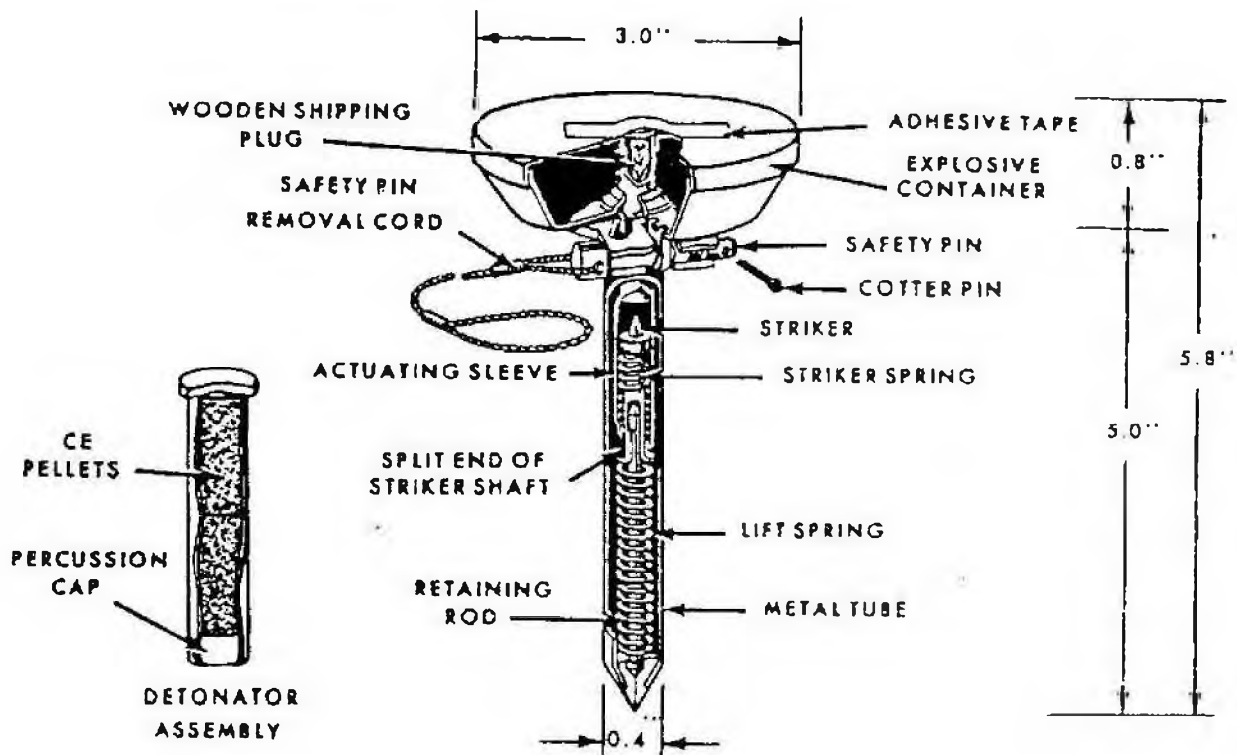


Figure 9-196. Fuze, Pressure Release, No. 12, Mark 1.

a. *General.* The fuze is of the instantaneous, mechanical type and consists of a cylindrical metal tube, pointed at the bottom, and a mushroom-shaped metal container holding 4 oz of explosive.

b. *Use.* This fuze is used for boobytrapping antitank mines or other objects weighing at least 2.5 lb. It may be used with or without a supplementary charge.

c. *Functioning.* When the weight is removed from the top of the fuze, the explosive container and the actuating sleeve move upward under the action of the compressed lift spring until the striker shaft is freed from the retaining rod, releasing the spring-loaded striker against the percussion cap and firing the detonator, which sets off the explosive in the mushroom-shaped explosive container.

d. *Installing and Arming.*

(1) Push the pointed end of the fuze body into the ground until the safety pin is level with the ground surface.

(2) Remove the wooden shipping plug and insert the percussion-cap-detonator assembly.

(3) Lay the mine or other object on top of the fuze.

(4) Remove the cotter pin from the end of the safety pin and pull out the safety pin—the pin should come out easily.

NOTE

It is impossible to withdraw the safety pin if the weight of the object on top of the fuze is less than 2.5 lb, because the explosive container and the adjusting sleeve will rise slightly.

e. *Disarming.* Mines incorporating this fuze should not be disarmed, but should be destroyed in place.

9-121. Fuze, Pull, Pressure, Pressure-Release, No. 13, Mark 2 (United Kingdom)

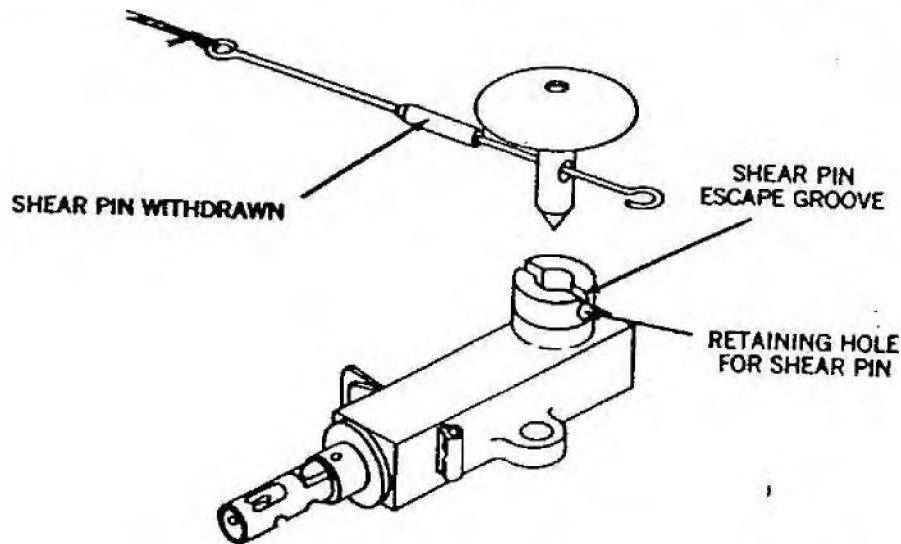


Figure 9-197. Fuze, Pull, Pressure, Pressure-Release, No. 13, Mark 2.

Dimensions	Case	Internal action	Operating force
Diameter: 4" approx. Height: 2" approx. Length: 9.7" approx.	Die-cast metal	Mechanical with removable shear pin.	35 lb or more

a. *General.* This is a rectangular fuze, containing a spring-loaded striker, an actuating pin pointed on the bottom with a pressure head on

top, and a shear pin. The shear pin, with piano wire attached to either end, extends through the turret and the actuating pin. A fuze adapter or

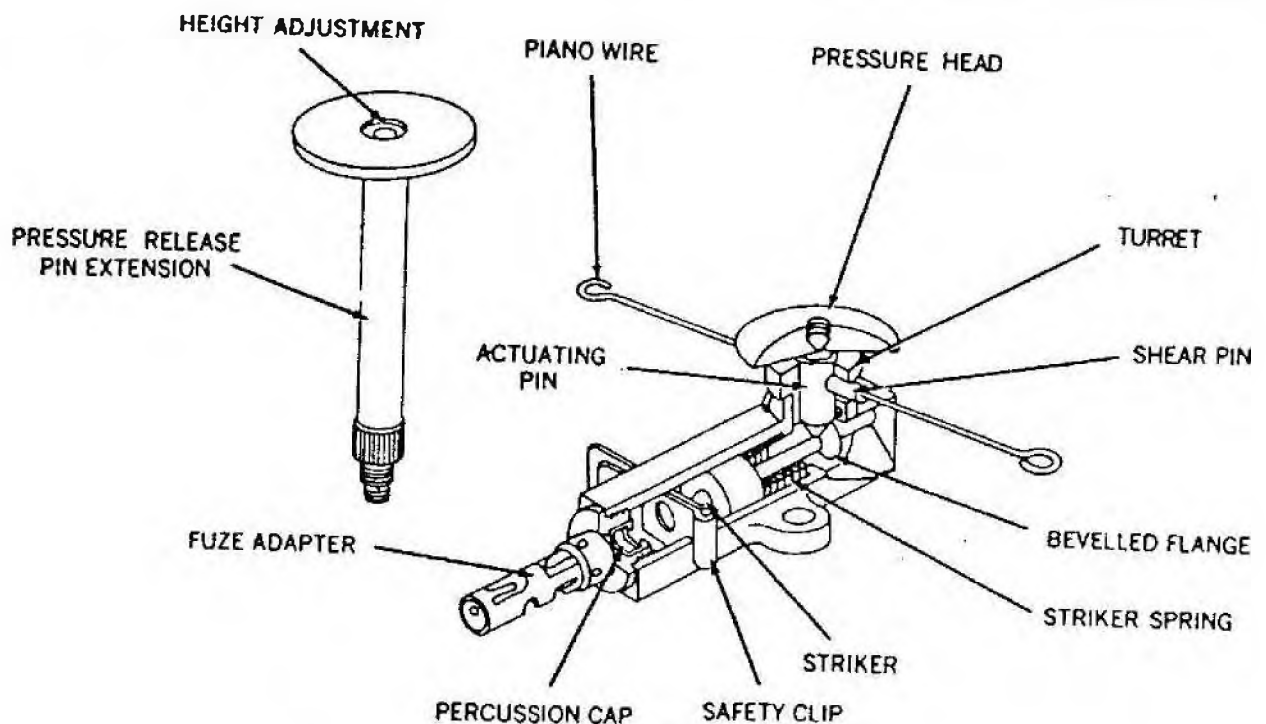


Figure 9-198. Fuze, Pull, Pressure, Pressure-Release, No. 13, Mark 2.

detonator adapter with a built-in percussion cap is screwed into the end of the fuze. The fuze also has a safety clip.

b. *Use.* This fuze is employed as an anti-lift device or a boobytrap igniter.

c. *Functioning.*

(1) *Pull.* A pull on one of the trip wires attached to the loop of the piano wire withdraws the shear pin, allowing the beveled flange on the striker shaft to raise the actuating pin, which releases the spring-loaded striker against the percussion cap.

(2) *Pressure.* Pressure either on the adjustable extension rod or the pressure head of the actuating pin, shears the shear pin and snaps the striker shaft just in front of the beveled flange, releasing the spring-driven striker to fire the percussion cap.

(3) *Pressure-release.* The shear pin is withdrawn. The removal of the weight from the pressure head of the actuating pin allows the beveled flange on the striker shaft to raise the actuating pin, releasing the spring-loaded striker against the percussion cap.

d. *Installing and Arming.*

(1) *Pull.*

(a) Attach the fuze to an object.

(b) Attach time fuze or detonating cord to the fuze adapter or insert a detonator in the detonator adapter.

(c) Rotate the turret to the desired position and tie an anchored trip wire to the loop of the piano wire on either end of the shear pin.

(d) Withdraw the safety clip.

(2) *Pressure.*

(a) Attach the fuze to an object.

(b) Attach time fuze or detonating cord to the fuze adapter or insert a detonator in the detonator adapter.

(c) If the adjustable extension rod is used, adjust it upward until contact is made with the object to be boobytrapped.

(d) Withdraw the safety clip.

(3) *Pressure release.*

(a) Attach the fuze to an object.

(b) Attach time fuze or detonating cord to the fuze adapter or insert a detonator in the detonator adapter.

(c) Place a weight (3 to 20 lb) on the pressure head of the actuating pin.

(d) Withdraw the shear pin and piano wire.

(e) Withdraw the safety pin.

NOTE

When set for pressure-release, the fuze will also function by pressure.

e. *Disarming.*

(1) *Pull or pressure.*

(a) See that the shear pin extends all the way through the turret.

(b) Cut the slack trip wires tied to the piano wire on either end of the shear pin.

(c) Insert the safety clip or a piece of sheet metal in the safety clip slot.

(d) Cut the time fuze or detonating cord that connects the fuze to the charge and remove the detonator from the fuze.

(2) *Pressure-release.*

(a) Insert the safety clip or a piece of sheet metal in the safety clip slot, being careful not to disturb the weight resting on the pressure head of the actuating pin.

(b) Insert the shear pin or a nail through the turret to prevent any vertical movement of the turret.

(c) Cut the time fuze or detonating cord that connects the fuze to the charge or remove the detonator from the fuze, whichever applies.

(d) Remove the weight from the pressure head of the actuating pin.

f. *Precaution.* Any increase in weight on the pressure head of the actuating pin will snap the striker shaft, releasing the striker against the percussion cap.

9-122. Fuze, Pressure, No. 2, Mark 2 (United Kingdom)

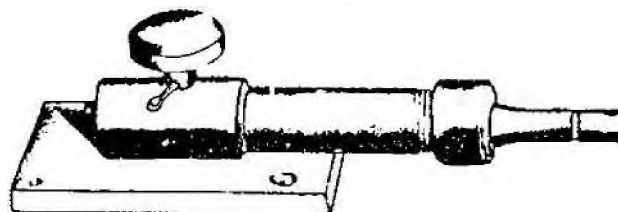


Figure 9-199. Fuze, Pressure, No. 2, Mark 2.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height:	No data	Mechanical	40 lb approx.

a. *Use.* For example, the fuze can be used under a board in a building to set off explosive to wreck the building (when entered) or under a railroad tie to damage track and wreck a passing train.

b. *Functioning.* Pressure on the head of the shear pin causes it to break the strike rod, thereby releasing the striker, which driven by its spring fires the percussion cap.

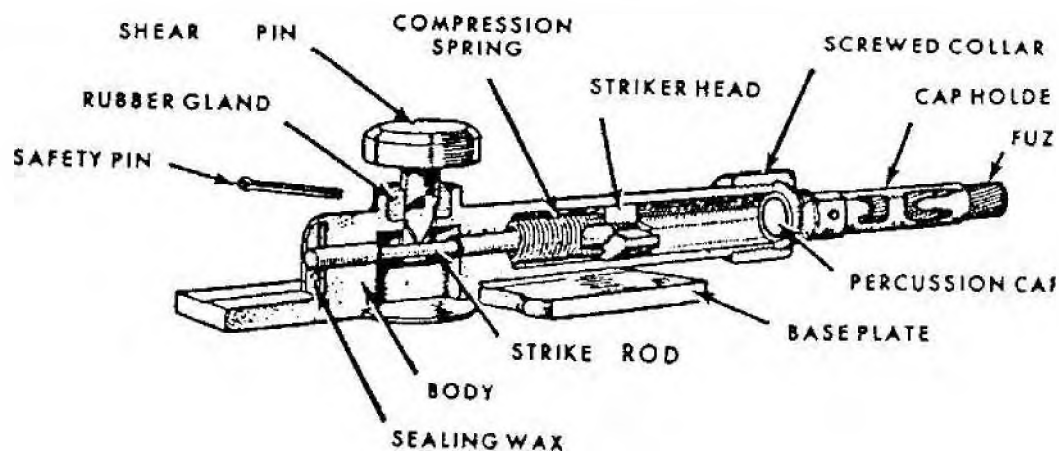


Figure 9-200. Fuze, Pressure, No. 2, Mark 2.

9-123. Mine, Antitank, Pz-Mi-2 (West Germany)

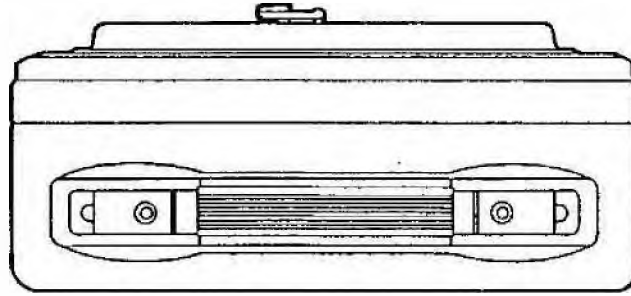


Figure 9-201. Mine, Antitank, Pz-Mi-2.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 6.2"	18.7 or 20.2 lb	Pressure	330-375 lb	9.9 or 11.4 lb RDX/TNT 50/50	No data

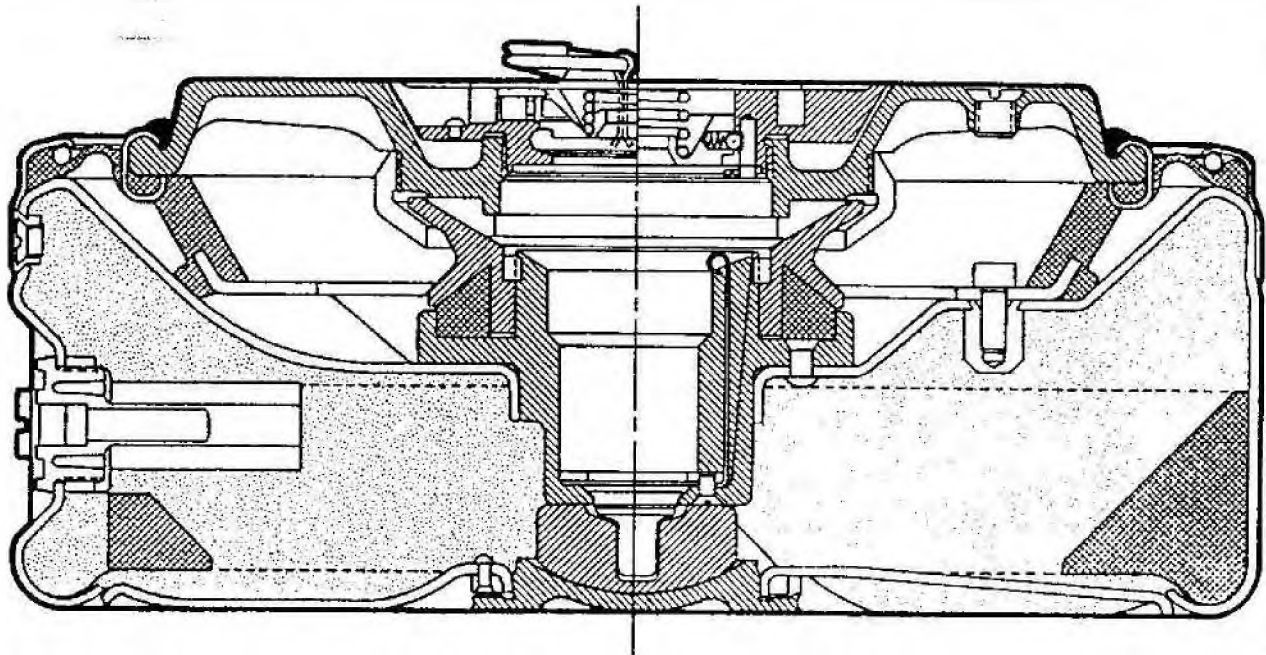


Figure 9-202. Mine, Antitank, Pz-Mi-2.

a. General. The mine has a case of aluminum alloy with a fuze well in the top center. The fuze functions to activate the mine and may also be set to prevent removal of the cover for deactivation. The mine, so armed, is permanently activated and dangerous to enemy and friendly troops alike.

b. Use. The mine is laid on or under the ground

surface. It can be air-dropped from 10 meters height.

c. Functioning. A central movable pressure disk acts on the fuze cap. A fuze safety pin prevents accidental downward movement of the pressure disk. The mine is resistant to shock waves. Tilting motion of the cover actuates the fuze cap and detonates the mine.

9-124. Mine, Antitank, DM-11 (West Germany)

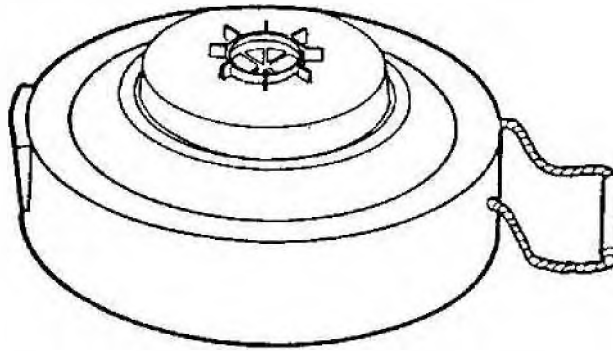


Figure 9-203. Mine, Antitank, DM-11.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 11.8" Height: 3.7"	15.4 lb	Pressure friction	330-880 lb	Cast TNT 14.3 lb	RDX 1.1 lb

General. This mine is very similar to the French M-51 antitank mine. It is made entirely of explosives mixed with approximately 5 percent

polyester resin for added strength. It is used primarily as a blast type antitank mine which is capable of disabling a tank.

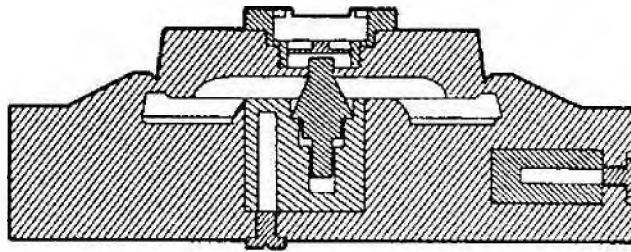


Figure 9-204. Mine, Antitank, DM-11.

9-125. Mine, Antipersonnel, DM-11 (West Germany)

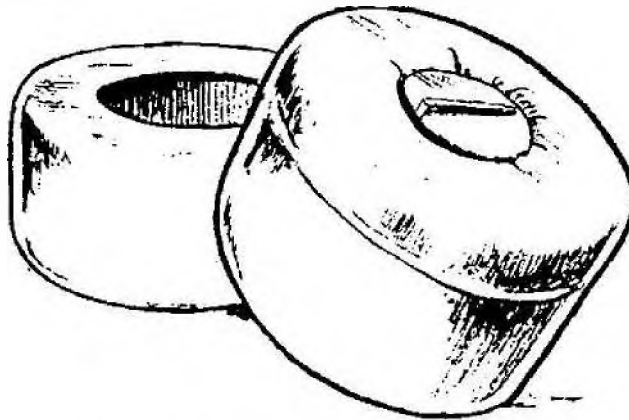


Figure 9-205. Mine, Antipersonnel, DM-11.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 3.2" Height: 1.2"	7 oz	No data	11-22 lb	3.5 oz.	No data

9-126. Fuze, DM-29 (West Germany)

Illustrations furnished for identification.

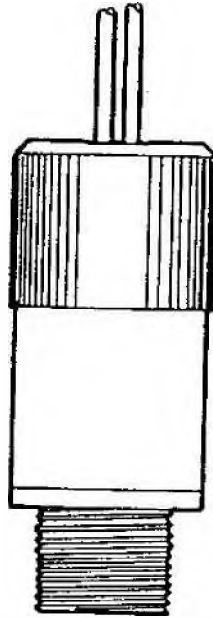


Figure 9-206. Fuze, DM-29.

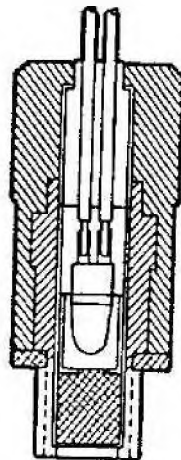


Figure 9-207. Fuze, DM-29.

9-127. Fuze, Pressure, Pull-Release DM-56 (West Germany)

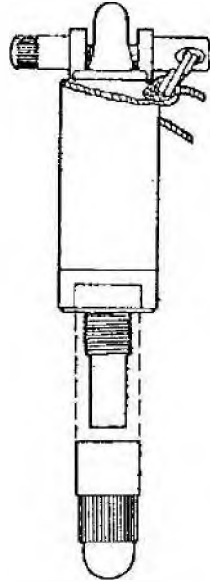


Figure 9-208. Fuze, Pressure, Pull-Release DM-56.

Dimensions	Case	Internal action	Operating force
Diameter: No data Height: 3.6"	Brass	No data	Pull—16 lb

a. *General.* The fuze has a brass case with a plastic shipping cap at the primer-detonator end.

b. *Use.* Although this fuze is designated as a pressure fuze, it can also be used as a pull-release fuze.

c. *Functioning.* As pressure fuze: When pressure is applied to the striker head, the pressure snap is forced outward. The striker groove passes through the expanded snap and the striker is then driven downward by the striker spring. The striker hits and ignites the percussion primer which, in turn, ignites the primer-detonator. As pull-release fuze: With a tripwire attached to the pressure snap and with the safety pin removed, an approximately 16-lb pull will expand the pressure snap and release the snap from the striker spring. The striker spring, thus released, then forces the striker to activate the primer-detonator.

d. Installing and Arming.

As pressure fuze:

- (1) Screw the fuze into the mine.
- (2) Unscrew the safety pin nut from the safety pin.
- (3) Remove safety pin from the fuze by means of the cord attached to the ring in the safety pin.

As pull release fuze:

- (1) Screw fuze into mine.
- (2) Attach a tripwire to one end of the pressure snap.
- (3) Remove the safety pin.

e. *Precaution.* After removal of the safety pin, the safe condition depends only on the restraint of the pressure snap in the groove of the striker.

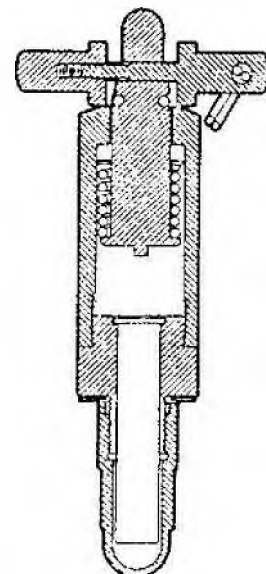


Figure 9-209. Fuze, Pressure, Pull-Release DM-56.

9-128. Fuze, DM-27 (West Germany)

Illustrations furnished for identification.

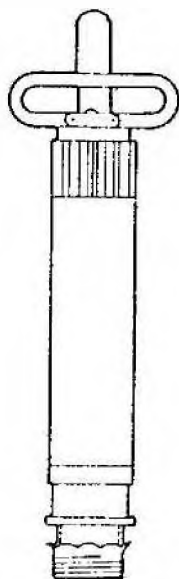


Figure 9-210. Fuze, DM-27.

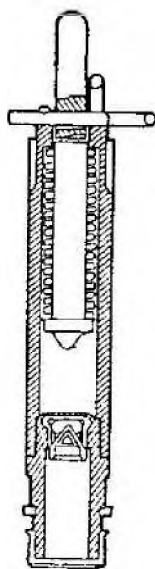


Figure 9-211. Fuze, DM-27.

CHAPTER 10

FREE WORLD MINEFIELD LAYING, DETECTION, AND BREACHING EQUIPMENT

10-1. Trends in Research

Emphasis of Free World countries is on the development of mechanical ground mine laying equipment and the development of aerial delivery systems. All major Free World countries have mine planters under continuing research and development. Aerial delivery systems being researched include helicopter, high performance aircraft, rocket, and artillery delivery.

10-2. Free World Detection and Breaching Equipment

Except for the United Kingdom, there is limited research and development by the foreign free world countries in minefield detection and breaching. These countries depend on the United States for the material and the results of research and development. Italy has experimented with a steam-driven rocket that tows a linear mine-clearing charge. Japan has developed a mine-clearing charge and has tested a tank-mounted mine-clearing roller system. In general, most countries have improved metallic mine detectors by miniaturization. The search for an effective nonmetallic mine detector continues. Specific items of mine clearing equipment of the United Kingdom, West Germany, and Sweden are discussed below.

10-3. United Kingdom

a. Detection Equipment.

(1) *Mine detector No. 6A.* The United Kingdom has experimented with various methods in an effort to produce a reliable mine detection system. The No. 6A metallic detector, powered by dry-cell batteries operates on a regenerative principle and consists of an amplifier, detector head assembly, search handle, power supply, and portable waterproof control panel. Although it detects metallic objects to a depth of 10 inches, it has a serious disadvantage—the batteries have an operating life of only 16 hours.

(2) *Mine probe, No. 4 (United Kingdom).* This device (fig. 10-1) has a pistol grip handle,

two light metal tubular sections, and a stainless steel probe tip. The four parts are assembled for operation in the standing position. It may be shortened by assembly with only one tubular section, or by screwing the probe tip directly to the pistol grip handle for use from a kneeling or a prone position. The device is carried with the probe tip screwed inside one of the tubular sections. The overall length is 5 feet, and the weight, approximately 2 pounds. When not in use, it is disassembled and placed in a canvas carrying bag attached to the left shoulder strap of the field web equipment.

(3) *Mine detector No. 4A (United Kingdom)* (fig. 10-2). This is an improvement on the miniature, waterproofed No. 4 model having changes in the control box and on-and-off switch. It is identical to the NO. 4, however, in other respects. This detector is designed on the regenerative amplifier principle. The advantages of this are that it requires only one control knob, has quick response to oscillation, produces no residual signal in the headphones, has a reduced number of components, and is easy to produce.

(a) *Detector-head assembly.* The oval shaped search coil head that houses the two overlapping coils is 10.8 by 6.7 by 1.4 inches. It consists of top and bottom plastic plates cemented together and sealed with linen tape. Later models have search heads made of upper and lower molded plastic sections held together by a riveted flange.

(b) *Search handle.* This is a telescopic steel pole in four sections. The collapsed length is 14.8 inches; the expanded length is 50.5 inches.

(c) *Amplifier.* This two-part cast aluminum case measures 11.8 by 2.4 by 2.4 inches. The upper compartment contains the amplifier unit with its three miniature pentode tubes; the lower holds the batteries. The cables to the headphones, control box, and search head emerge through the top of the case. The oscillator is tuned to a resonant frequency of 1,300 cps.

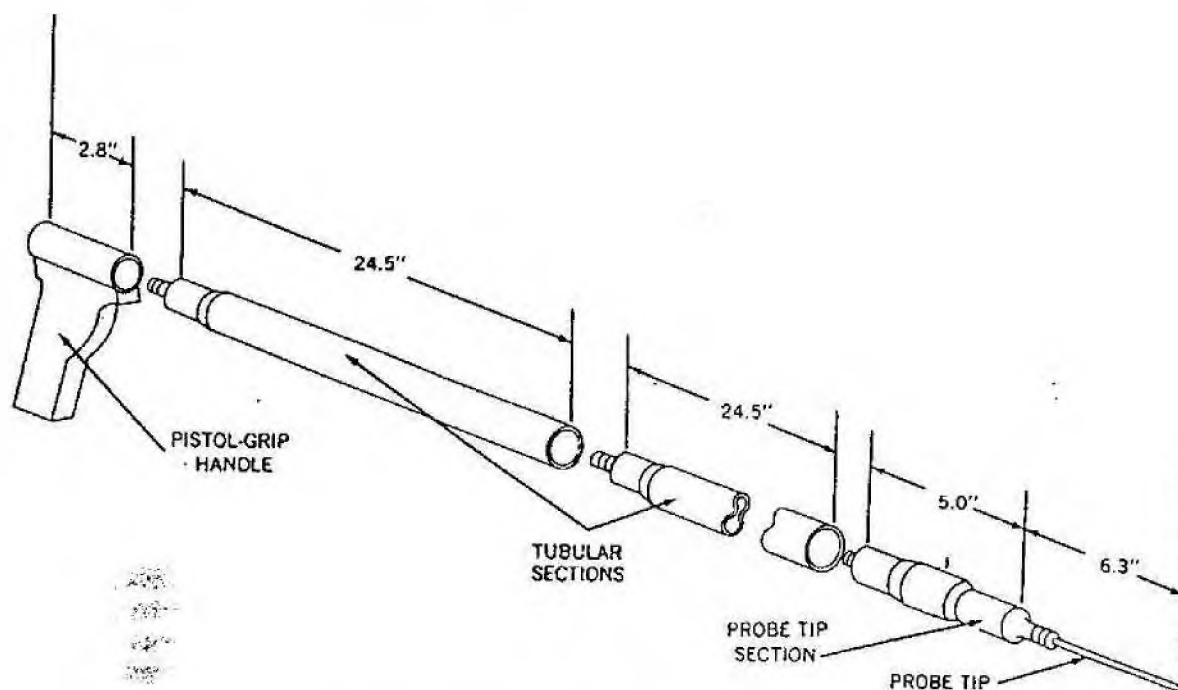


Figure 10-1. Mine probe No. 4 (United Kingdom).

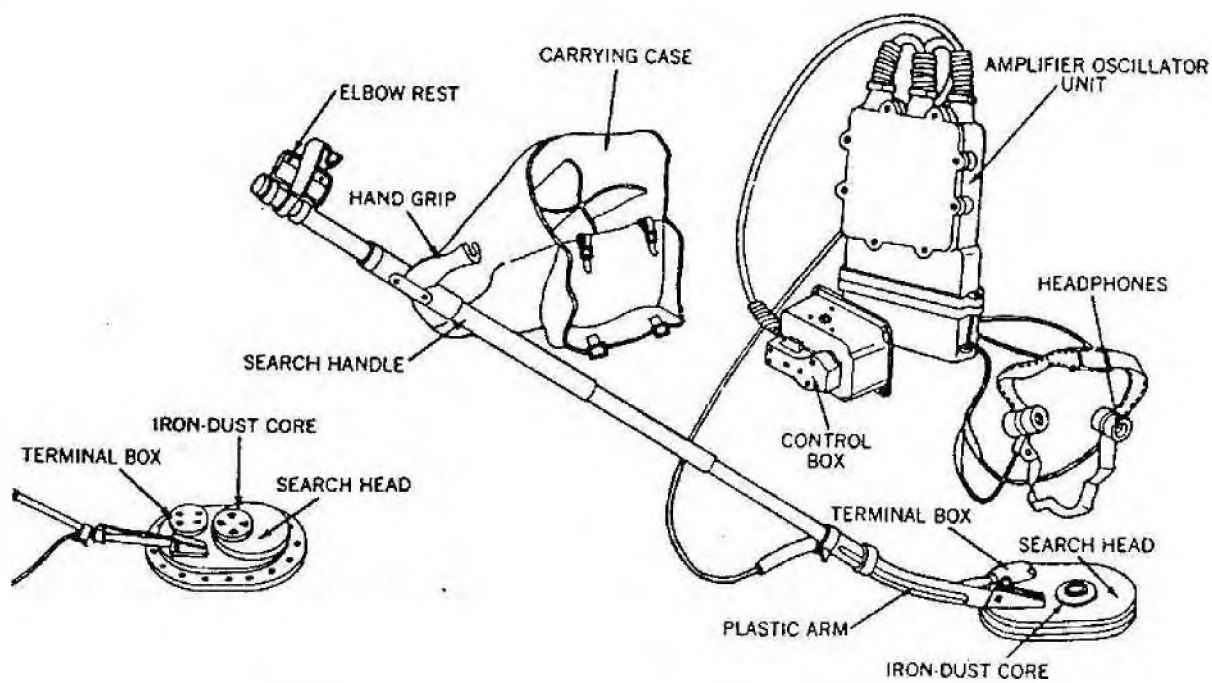


Figure 10-2. Mine detector No. 4A (United Kingdom).

(d) *Power supply.* One type of power supply has a 1½-volt battery and a 60-volt battery in a common unit. The other type, for tropical use, has a 72-volt instead of a 60-volt battery.

(e) *Controls.* The control box is made of cast aluminum 4.9 by 2.9 by 2.4 inches. It is clipped to the shoulder strap of the webbed haversack. The switch has three positions, off, normal, and pave.

(f) *Aural indicators.* The headphones, completely enclosed in rubber, are connected with a webbing harness and permanently attached to the amplifier.

(g) *Carrying case and transit case.* The complete detector is contained in a webbed haversack 14.8 by 6.9 by 10.8 inches. When the detector is used, the haversack containing the amplifier is worn on the back. A wooden transit case is provided to carry the complete equipment, including spare tubes, batteries, and an iron-dust core cover. It measures 23.7 by 13.8 by 10.8 inches. The total weight of the apparatus in the haversack is 24.0 pounds and in the transit case, 54.0 pounds. The average operating life of batteries under temperate conditions is 60 to 100 hours.

b. *Breaching Equipment.* The United Kingdom has deemphasized the use of mine rollers and flails as minefield breaching devices and current emphasis is placed on explosive line charges for breaching purposes. The United Kingdom has produced and standardized two explosive line charges for breaching antipersonnel and antitank minefields.

(1) *The Mark 2 Baby Viper.* The Mark 2 Baby Viper (fig. 10-3) used for breaching minefields, is an explosive-filled hose 0.62 inch in diameter and more than 600 feet long; it is projected across an area by a rocket fired from a launcher and is then detonated. The unit consists of six boxes, each contains a coiled 100-foot section of explosive hose, a rocket launcher, and a 127-milimeter rocket.

(2) *The Giant Viper L-1.* The Giant Viper L-1 (fig. 10-4) also has a rocket to project it across a minefield. It is designed to clear a route wide enough for tracked and wheeled vehicles and explode 90 percent of all mines in a lane 7.5 meters wide and 214 meters long. The explosive hose, 3 inches in diameter and 754 feet long, is filled with PE-2, an aluminized plastic explosive and is coiled within a removable box. The container, mounted on a trailer, is towed into position by a tank; the propelling rocket is then aimed manually and fired electrically.

10-4. West Germany

a. *Barrier-Clearing Device; Mine-Detonating Net, PFAD, DT 21.* The DT 21, packaged in a reinforced canvas case, is towed into position by a vehicle. Two men anchor the device and ignite a 20-second delay fuze; this fuze, in turn, ignites a DM 8 rocket. The rocket's travel causes a string of 200 charges, each weighing 1.76 ounces, to be extracted and pulled full-length across the minefield, whereupon the net is detonated automatically. The PFAD, DT 21 is designed to clear antipersonnel

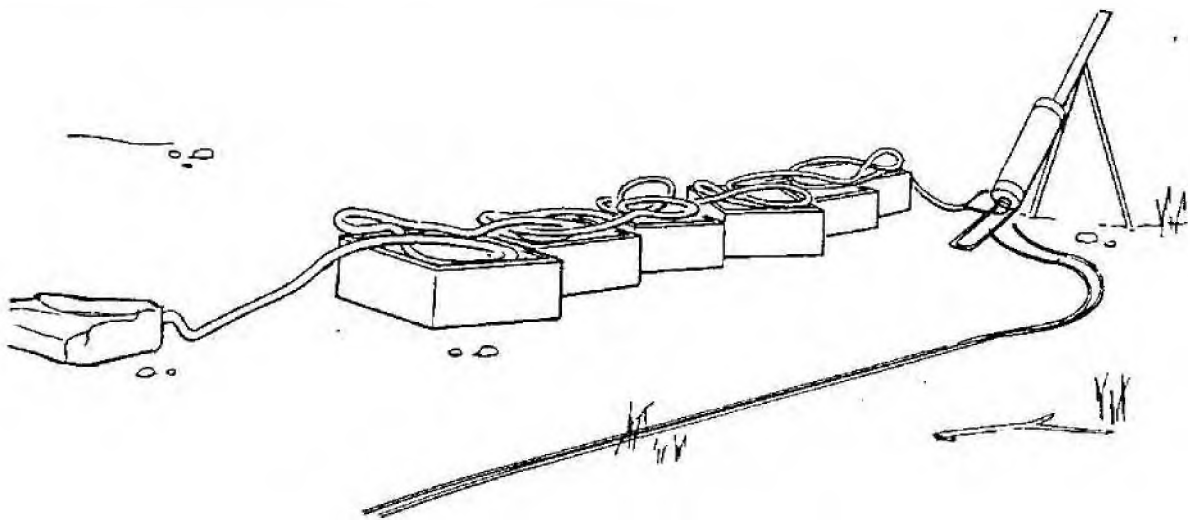


Figure 10-3. Mark 2 "Baby Viper" explosive line charge for antipersonnel minefield (United Kingdom).

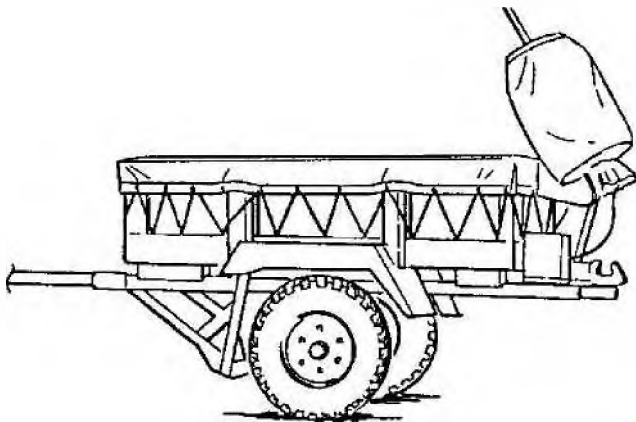


Figure 10-4. "Giant Viper" L-1, explosive line charge for antitank minefield (United Kingdom).

mines from a path 80 centimeters wide and 50 meters long.

b. *Mine Detector: "Forrester"*. The Forrester is

a compact, sensitive, mutual-induction balanced coil system metallic mine detector.

10-5. Sweden

a. *Detection*. Sweden has an electronic mine detector which is of conventional balanced electromagnetic circuit type.

b. *Mine Clearing*. Sweden uses a bangalore torpedo and a mineclearing linear charge (snake) to clear mines by explosive means. This special explosive hose is portable and is contained in seven packs, each weighing 42 pounds. The linear charge is 450 feet long and 1.3 inches in diameter, and contains 1-pound blocks of thyelene-covered explosive in every 3 feet of its length. The linear charge, or snake, is pulled into place over the minefield by a 100-mm rocket at 150 feet per second. After the rocket is fired and reaches the terminal of its flight, the snake lies on the mined ground. The fuze is then initiated, detonating the linear charge which explodes the mines and clears a path 60 cm wide and up to 137 m long.

APPENDIX A

REFERENCES

DA Pam 108-1	Index of Army Motion Pictures and Related Audio-Visual Aids.
AR 310-25	Dictionary of United States Army Terms.
AR 385-63	Regulations for Firing Ammunition for Training, Target Practice, and Combat.
FM 5-25	Explosives and Demolitions
FM 5-31	Boobytraps.
FM 20-32	Land Mine Warfare.

APPENDIX B
METRIC SYSTEM EQUIVALENTS

<i>Metric</i>	<i>U.S.</i>
1 millimeter (mm) =	0.04"
1 centimeter (cm) =	0.39"
1 meter (m) =	39.37"
1 gram (g or gm) =	0.035 oz.
1 kilogram (kg) =	2.2046 lb.